Repair-Parts

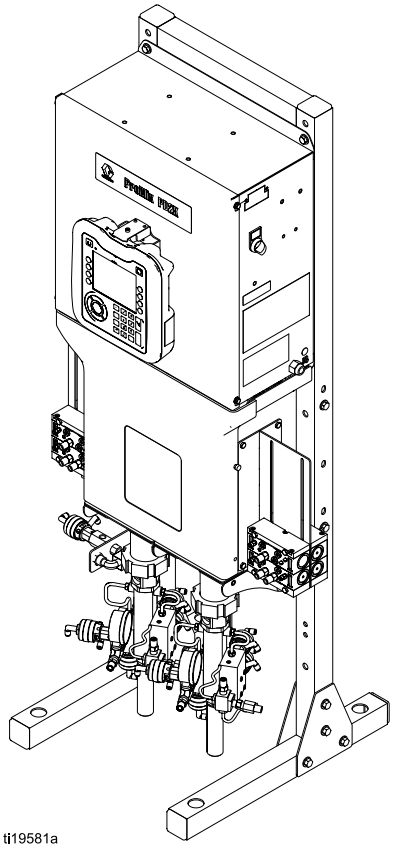
ProMix® PD2K Electronic Proportioner

3A2800B
EN

Positive displacement proportioning of 2-component materials helps reduce waste. Manual system with Advanced Display Module. For professional use only.

Important Safety Instructions
Read all warnings and instructions in this manual.
Save these instructions.

See page 3 for model part numbers and approvals information.



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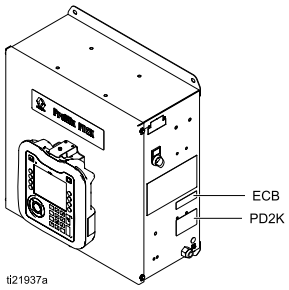
Models

See Figs. 1–7 for component identification labels, including approval information and certification.

Part No.	Series	Maximum Air Working Pressure	Maximum Fluid Working Pressure	Location of PD2K and Electrical Control Box (ECB) Labels
MC1000	A	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)	
MC2000	A	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)	

CE 0359 Ex II 2 G FM C US APPROVED

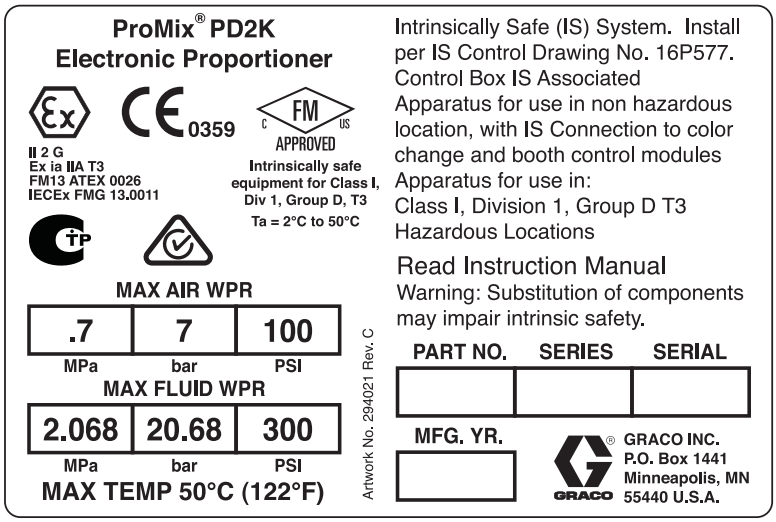

ProMix® PD2K
Electronic Proportioner
0359
FM C US APPROVED
II 2 G
Ex ia IIA T3
FM13 ATEX 0026
IECEx FMG 13.0011
Intrinsically safe equipment for Class I, Div 1, Group D, T3
Ta = 2°C to 50°C
MAX AIR WPR
.7 7 100
MPa bar PSI
MAX FLUID WPR
2.068 20.68 300
MPa bar PSI
MAX TEMP 50°C (122°F)
Artwork No. 294021 Rev. C
Intrinsically Safe (IS) System. Install per IS Control Drawing No. 16P577. Control Box IS Associated Apparatus for use in non hazardous location, with IS Connection to color change and booth control modules Apparatus for use in: Class I, Division 1, Group D T3 Hazardous Locations
Read Instruction Manual
Warning: Substitution of components may impair intrinsic safety.
PART NO.
SERIES
SERIAL
MFG. YR.
GRACO INC.
P.O. Box 1441
Minneapolis, MN
55440 U.S.A.

Figure 1 Model MC1000 (Low Pressure) Identification Label

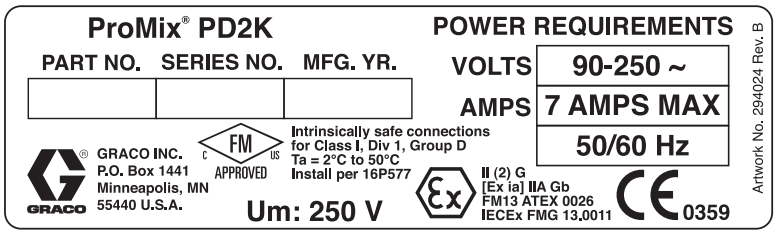
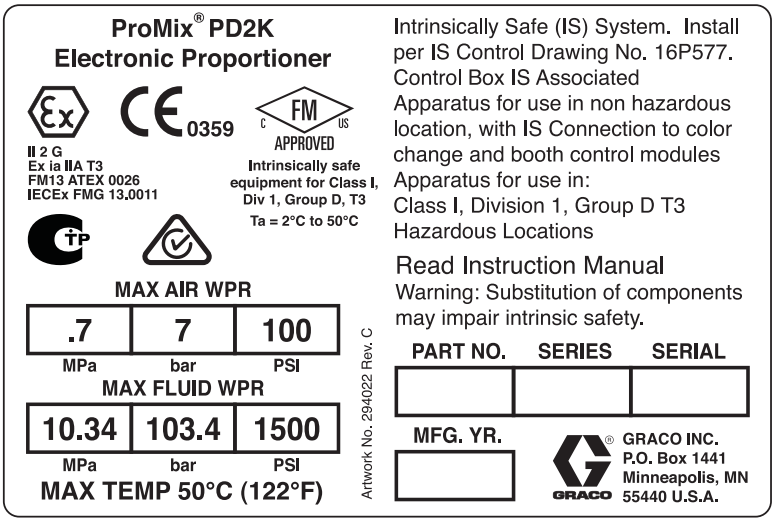


Figure 2 24M672 Control Box Identification Label

Continued on the next page.


ProMix® PD2K
Electronic Proportioner
II 2 G
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0359
FM
APPROVED
Intrinsically safe equipment for Class I, Div 1, Group D, T3
Ta = 2°C to 50°C
MAX AIR WPR
.7 7 100
MPa bar PSI
MAX FLUID WPR
10.34 103.4 1500
MPa bar PSI
MAX TEMP 50°C (122°F)
Artwork No. 294022 Rev. C
Intrinsically Safe (IS) System. Install per IS Control Drawing No. 16P577. Control Box IS Associated Apparatus for use in non hazardous location, with IS Connection to color change and booth control modules Apparatus for use in: Class I, Division 1, Group D T3 Hazardous Locations
Read Instruction Manual
Warning: Substitution of components may impair intrinsic safety.
PART NO. SERIES SERIAL
MFG. YR.
GRACO INC.
P.O. Box 1441
Minneapolis, MN
55440 U.S.A.

Figure 3 Model MC2000 (High Pressure) Identification Label

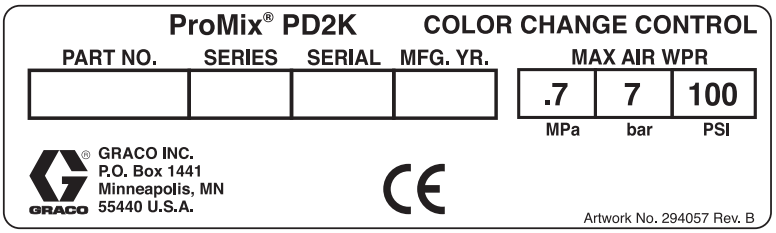


Figure 4 Non-Intrinsically Safe Color Change Control (Accessory) Identification Label

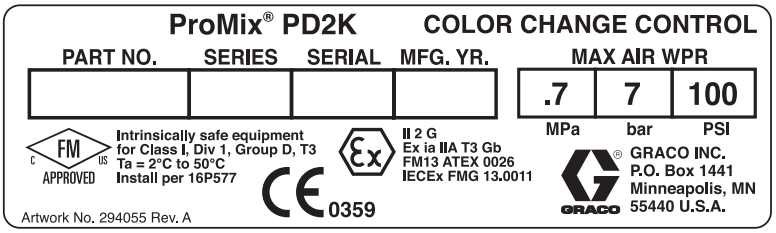


Figure 5 Intrinsically Safe Color Change Control (Accessory) Identification Label

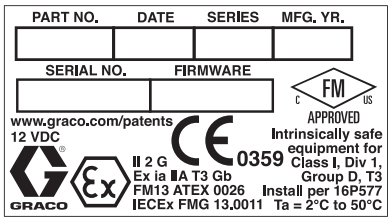


Figure 6 Booth Control Identification Label

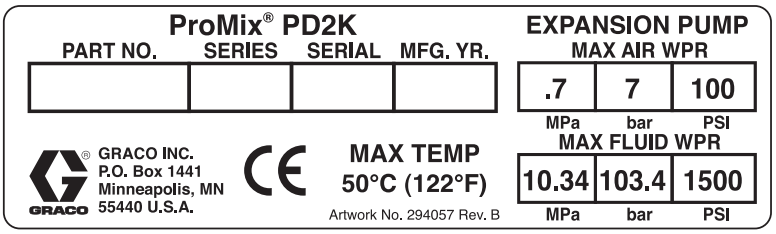


Figure 7 Pump Expansion Kit (Accessory) Identification Label

Related Manuals

Manual No.	Description
332457	PD2K Proportioner Installation Manual, Manual Systems
332562	PD2K Proportioner Operation Manual, Manual Systems
3A2801	Mix Module Instructions-Parts Manual
332339	Pump Repair-Parts Manual

Manual No.	Description
332454	Color Change Valve Repair-Parts Manual
332455	Color Change Kits Instructions-Parts Manual
332456	3rd and 4th Pump Kits Instructions-Parts Manual

Warnings

The following warnings are for the setup, use, grounding, maintenance and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive.
- **Stop operation immediately** if static sparking occurs or you feel a shock, Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

ELECTRIC SHOCK HAZARD

This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment.
- Connect only to grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

WARNING

INTRINSIC SAFETY

Intrinsically safe equipment that is installed improperly or connected to non-intrinsically safe equipment will create a hazardous condition and can cause fire, explosion, or electric shock. Follow local regulations and the following safety requirements.

- Be sure your installation complies with national, state, and local codes for the installation of electrical apparatus in a Class I, Group D, Division 1 (North America) or Class I, Zones 1 and 2 (Europe) Hazardous Location, including all of the local safety fire codes (for example, NFPA 33, NEC 500 and 516, OSHA 1910.107, etc.).
- To help prevent fire and explosion:
  - Do not install equipment approved only for a non-hazardous location in a hazardous location. See model ID label for the intrinsic safety rating of your model.
  - Do not substitute system components as this may impair intrinsic safety.
- Equipment that comes in contact with the intrinsically safe terminals must be rated for Intrinsic Safety. This includes DC voltage meters, ohmmeters, cables, and connections. Remove the unit from the hazardous area when troubleshooting.

SKIN INJECTION HAZARD

High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate surgical treatment.**

- Do not spray without tip guard and trigger guard installed.
- Engage trigger lock when not spraying.
- Do not point gun at anyone or at any part of the body.
- Do not put your hand over the spray tip.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop spraying/dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.

- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.

⚠ WARNING

TOXIC FLUID OR FUMES

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDSs to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear chemically impermeable gloves when spraying, dispensing, or cleaning equipment.

PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

EQUIPMENT MISUSE HAZARD

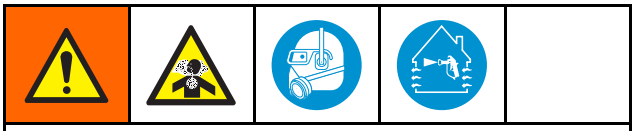
Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure.
- Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

Important Isocyanate (ISO) Information

Isocyanates (ISO) are catalysts used in two component materials.

Isocyanate Conditions



Spraying or dispensing materials containing isocyanates creates potentially harmful mists, vapors, and atomized particulates.

Read material manufacturer's warnings and material MSDS to know specific hazards and precautions related to isocyanates.

Prevent inhalation of isocyanate mists, vapors, and atomized particulates by providing sufficient ventilation in the work area. If sufficient ventilation is not available, a supplied-air respirator is required for everyone in the work area.

To prevent contact with isocyanates, appropriate personal protective equipment, including chemically impermeable gloves, boots, aprons, and goggles, is also required for everyone in the work area.

Material Self-ignition

Some materials may become self-igniting if applied too thick. Read material manufacturer's warnings and material MSDS.

Keep Components A and B Separate

Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:

- **Never** interchange component A and component B wetted parts.
- Never use solvent on one side if it has been contaminated from the other side.

Moisture Sensitivity of Isocyanates

Exposure to moisture (such as humidity) will cause ISO to partially cure; forming small, hard, abrasive crystals, which become suspended in the fluid. Eventually a film will form on the surface and the ISO will begin to gel, increasing in viscosity.

NOTICE

Partially cured ISO will reduce performance and the life of all wetted parts.

- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. **Never** store ISO in an open container.
- Keep the ISO pump wet cup or reservoir (if installed) filled with appropriate lubricant. The lubricant creates a barrier between the ISO and the atmosphere.
- Use only moisture-proof hoses compatible with ISO.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Always lubricate threaded parts with an appropriate lubricant when reassembling.

NOTE: The amount of film formation and rate of crystallization varies depending on the blend of ISO, the humidity, and the temperature.

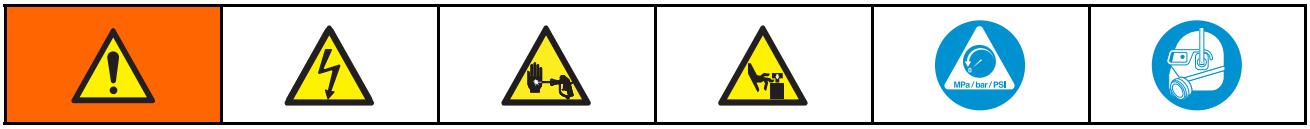
Changing Materials

NOTICE

Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime.

- When changing materials, flush the equipment multiple times to ensure it is thoroughly clean.
- Always clean the fluid inlet strainers after flushing.
- Check with your material manufacturer for chemical compatibility.
- When changing between epoxies and urethanes or polyureas, disassemble and clean all fluid components and change hoses. Epoxies often have amines on the B (hardener) side. Polyureas often have amines on the A (resin) side.

Troubleshooting



NOTE: Check all possible remedies before disassembling the system.

System Troubleshooting

Problem	Cause	Solution
Unit will not operate.	Inadequate power supply.	See Technical Data, page 59.
	Power switch is off.	Turn switch on.
	Main power is shut off.	Turn main power switch on.
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Fluid dried on piston rod.	Disassemble and clean pump. See pump manual. In future, stop pump at bottom of stroke.
Pump output low on both strokes.	Inadequate power supply.	See Technical Data, page 59.
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Worn piston packings.	Replace. See pump manual.
Pump output low on only one stroke.	Held open or worn dosing valves.	Check and repair. See valve manual.
	Worn piston packing.	Replace. See pump manual.
No output.	Improperly installed dosing valves.	Check solenoid connections to valves. See pump manual.
Pump operates erratically.	Exhausted fluid supply.	Refill and reprime pump.
	Held open or worn dosing valves.	Check and repair. See pump manual.
	Worn piston packing.	Replace. See pump manual.

Error Code Troubleshooting

System errors alert you of a problem and help prevent off-ratio spraying. There are three types: Advisory, Deviation, and Alarm.

An **Advisory** records an event in the system, and will clear itself after 60 seconds.

A **Deviation** records an error in the system but does not shut down the equipment. The deviation must be acknowledged by the user.

If an **Alarm** occurs, operation stops.

If any of the three types occur:

- Alarm buzzer sounds (unless in silent mode).
- Alarm popup screen shows the active alarm code.
- Status bar on the Advanced Display Module shows the active alarm code.
- Alarm is saved in the date/time stamped log.

NOTE: When an error occurs be sure to determine the code before resetting it. If you forget which code occurred, the Errors screen displays the 200 most recent errors, with date, time, and description.

NOTE: In some error codes listed below, a # symbol is shown as the last digit. This symbol represents the applicable pump number, which can vary. The unit's display will show the applicable pump number as the last digit in the code.

Code	Type	Description	Problem	Cause	Solution
B9A0	Advisory	Volume Rollover A Current	Batch counter for material A rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9AX	Advisory	Volume Rollover A Lifetime	Grand total counter for material A rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9B0	Advisory	Volume Rollover B Current	Batch counter for material B rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9BX	Advisory	Volume Rollover B Lifetime	Grand total counter for material B rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9D#	Advisory	Volume Rollover Pump #	Grand total counter for pump # rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a

Code	Type	Description	Problem	Cause	Solution
B9S0	Advisory	Volume Rollover Solvent Current	Batch counter for material S rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9SX	Advisory	Volume Rollover Solvent Lifetime	Grand total counter for material S rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
CAC#	Alarm	Comm. Error Color Change #	System does not see the Color Change Module #.	This communication error indicates that the network has lost communication with the Color Change Module #.	Check CAN cable connections to the Color Change Module # and any interconnected modules.
CA0X	Alarm	Comm. Error ADM	System does not see the Advanced Display Module.	This communication error indicates that the Network has lost communication with the Advanced Display Module.	Check CAN cable connecting ADM to the EFCM.
CADX	Alarm	Comm. Error Fluid Module	System does not see the Enhanced Fluid Control Module (EFCM).	This communication error indicates that the Network has lost communication with the EFCM.	Check CAN cables connecting ADM to the EFCM. Replace Cable or EFCM as necessary.
CANX	Advisory	Comm. Error Booth Control	System does not see the Booth Control (and manual system).	This communication error indicates that the Network has lost communication with the Booth Control module.	Check CAN cables connecting booth control to the Isolation board. Check Isolation board power. Replace cable, booth control, Isolation board or Barrier board as necessary.
CDC#	Alarm	Duplicate Color Change #	System sees two or more identical Color Change Modules.	More than one Color Change Module is connected in the system with the same address.	Check the system and remove the extra color change module.

Code	Type	Description	Problem	Cause	Solution
CDDX	Alarm	Duplicate Fluid Module	System sees two or more identical Fluid Control Modules.	More than one Fluid Control Module is connected in the system.	Check the system and remove the extra fluid control module.
CDNX	Alarm	Duplicate Booth Control	System sees two or more identical Booth Control Modules.	More than one Booth Control Module is connected in the system.	Check the system and remove the extra booth control module.
DA0#	Alarm	Exceeded Max Flow Pump #	Pump was driven to its maximum allowed speed.	System has a leak or open valve that is allowing unrestricted flow.	Inspect system for leaks.
				Pump is cavitating, cycling without restriction.	Verify pump is being supplied material.
				Viscosity of material is too thin for nozzle size.	Reduce nozzle size to create more restriction. Reduce paint pressure to lower the flow rate.
DE0#	Alarm	Leak Pump #	This is a manual stall test failure when the pump cannot build pressure to the target “Stall Test Pressure.” Will fault after 30 seconds.	No material in the pump or line.	Make sure the pump and down stream color line are loaded with material.
				Leak in the system.	Determine if leak is external or internal by visually inspecting the system for fluid leakage. Fix all loose or worn hoses, fittings, and seals. Inspect all valve seats and needles for wear, and replace worn piston or throat seals.
DF0#	Alarm	No Stall Up Pump #	Pump stall test failed; pump did not stall on the up stroke.	Valve failure, seal failure, worn rod or cylinder.	Replace inlet and outlet valve and seal for up stroke. Replace piston and throat seals. Replace rod and cylinder as necessary.

Code	Type	Description	Problem	Cause	Solution
DG0#	Alarm	No Stall Down Pump #	Pump stall test failed; pump did not stall on the down stroke.	Valve failure, seal failure, worn rod or cylinder.	Replace inlet and outlet valve and seal for down stroke. Replace piston and throat seals. Replace rod and cylinder as necessary.
DH0#	Alarm	No Stall Pump #	Pump stall test failed; pump did not stall on either the up or down stroke.	Valve failure, seal failure, worn rod or cylinder.	Replace inlet and outlet valve and seal for up and down strokes. Replace piston and throat seals. Replace rod and cylinder as necessary.
DK0#	Alarm	Position Pump #	The pump was detected to be out of position.		Re-enable pump power to reset pump.
EAUX	Advisory	USB Busy	USB drive has been inserted, download is in progress.	Indicates USB port is uploading or downloading data.	Wait for USB Idle.
EB00	Record	Stop Button Pressed	Record of a stop button press.	Indicates system stop key on ADM was pressed.	n/a
EBH#	Record	Home Complete Pump #	Record of pump homing complete.	An indication on the display that the pump completed the home function	No action required.
EBUX	Record	USB drive was removed.	USB drive was removed while downloading or uploading.	Downloading/uploading data on USB was interrupted by the USB device being removed.	Replace the USB device and begin process again.
EC00	Record	Setup Value(s) Changed	Record of changing setup variables.	Indicates date and time when setup values were changed.	n/a
EF0#	Alarm	Timeout Startup Pump #	Pump tried but was not able to move to the home position within a specified amount of time.	Pump dose valves did not actuate.	Verify air pressure to solenoid valves. Verify the valves are actuating.
				Motor could not drive pumps and linear actuator.	Verify motor is driving the pump.
				Pump stroke length is shortened by mechanical system tolerance.	Verify correct assembly of linear actuator and pump piston rods. See pump manual.

Code	Type	Description	Problem	Cause	Solution
EF1#	Alarm	Timeout Shutdown Pump #	Pump tried but was not able to move to the park position within a specified amount of time.	Pump dose valves did not actuate.	Visually inspect valves to ensure they are operating properly; verify they have air pressure above 85 psi (0.6 MPa, 6.0 bar).
				Pump is filled with thick paint and could not drive piston to end of stroke. Motor or drive is worn or damaged.	Observe motor and drive assembly to verify that the motor is generating force.
EL00	Record	System Power On	Record of power cycle (ON).	Indicates date and time when system was started.	n/a
EM00	Record	System Power Off	Record of power cycle (OFF).	Indicates date and time when system was turned off.	n/a
EMIX	Advisory	Pump Off	The pumps are not powered and are unable to move.	Pump power was turned off or an error occurred.	Start pumps by pressing pump start key on Advanced Display module, or hold down the Standby key on the booth control for 1-2 seconds..
EQU0	Advisory	USB Idle	USB download process completed, drive may be removed.	Data transfer is completed to the USB device.	Remove USB device from ADM.
EQU1	Record	USB Sys. Settings Downloaded	Settings were downloaded to USB drive.	User installed USB device in ADM USB port.	n/a
EQU2	Record	USB Sys. Settings Uploaded	Settings were uploaded from USB drive.	User installed USB device in ADM USB port.	n/a

Code	Type	Description	Problem	Cause	Solution
EQU3	Record	USB Custom Lang. Downloaded	Custom Language was downloaded to USB drive.	User installed USB device in ADM USB port.	n/a
EQU4	Record	USB Custom Lang. Uploaded	Custom Language was uploaded from USB drive.	User installed USB device in ADM USB port.	n/a
EQU5	Record	USB Logs Downloaded	Data logs were downloaded to USB drive.	User installed USB device in ADM USB port.	n/a
ES00	Advisory	Factory Defaults	Record of defaults being loaded.		n/a
EVUX	Advisory	USB Disabled	USB drive has been inserted, downloading is disabled.	Configuration of system is blocking data transfer.	Change configuration to enable USB download function.
F1F#	Alarm	Flow Low Fill Pump #	There has been no/low flow during a fill pump operation.	There is a restriction on the outlet side of the pump or color stack.	Make sure there are no restrictions in the color stack and that the dump valve is actuating.
				Thick viscosity paint requires more pressure to pump.	Increase non-mix pressure if necessary to create flow during the fill function.
F1S#	Alarm	Flow Low Purge Pump #	There has been no/low flow during a purge pump operation.	Restriction in the outlet side of the pump or color stack resulting in the solvent flow being too low.	Make sure there are no restrictions in the system. Increase non-mix pressure if necessary to create flow during the purge function.
F6F#	Alarm	Press. Sens. Removed Inlet #	Inlet pressure transducer has been disconnected when the system is expecting one.	Disconnected transducer.	Verify transducer is connected properly. Replace if reconnecting does not eliminate the alarm.
F7D#	Alarm	Flow Detected Pump #	The pump flow exceeded 20 cc/min flow coming into Idle mode.	There is a leak in the system or the gun was open when the system went into Idle mode.	Verify there are no leaks in the system. Make sure the air flow switch is actuating properly. Do not trigger the gun without atomizing air.

Code	Type	Description	Problem	Cause	Solution
F7P1	Alarm	Flow Detected Air Gun	The air flow switch is indicating unexpected atomizing air flow.	Air flow switch is stuck in flow position.	Clean or replace switch.
				Leak downstream in air line or fitting.	Check for leaks and tighten fittings.
				Air supply pressure fluctuation.	Eliminate pressure fluctuations.
F7S1	Alarm	Flow Detected Solvent Gun	The solvent flow switch is indicating unexpected solvent flow.	Solvent flow switch is stuck in flow position.	Clean or replace switch.
				There is a leak through the solvent cutoff valve.	Check for leaks and repair valve.
F8D1	Alarm	Flow Not Detected	No Flow while mixing.	Restriction in the outlet side of the pump or color stack.	Make sure there are no restrictions in the system.
F9D#	Alarm	Flow Unstable Pump #	The pump flow rate did not stabilize while entering Idle mode.	Potential leak in the system.	Check the system for leaks and run manual stall test.
MMUX	Advisory	Maint. USB Logs Full	USB memory is >90% full.	Configuration parameter on system is enabled to generate this advisory.	Complete download to ensure no data is lost.
P1F#	Alarm	Pressure Low Inlet Pump #	The inlet pressure on pump # is less than the user-entered alarm limit.		Increase inlet pressure.
P2F#	Deviation	Pressure Low Inlet Pump #	The inlet pressure on pump # is less than the user-entered deviation limit.		Increase inlet pressure.
P3D#	Deviation	Pressure High Outlet Pump #	The outlet pressure on pump # is greater than the user entered deviation limit.		Relieve system pressure.
P3F#	Deviation	Pressure High Inlet Pump #	The inlet pressure on pump # is greater than the user-entered deviation limit.		Decrease inlet pressure.
P4D#	Alarm	Pressure High Outlet Pump #	The outlet pressure on pump # is greater than the user entered alarm limit.		Relieve system pressure.
P4F#	Alarm	Pressure High Inlet Pump #	The inlet pressure on pump # is greater than the user-entered alarm limit.		Decrease inlet pressure.

Code	Type	Description	Problem	Cause	Solution
P6D#	Alarm	Press. Sens. Removed Outlet #	Outlet pressure transducer has been disconnected when the system is expecting one.	Disconnected transducer.	Verify transducer is connected properly. Replace if reconnecting does not eliminate the alarm.
P9D#	Alarm	Press. Sens. Failed Outlet #	Outlet pressure transducer has failed.	Outlet pressure transducer has failed or the pressure is above the readable range.	Relieve system pressure. Verify connections, or replace if reconnecting does not eliminate the alarm.
P9F#	Alarm	Press. Sens. Failed Inlet #	Inlet pressure transducer has failed.	Inlet pressure transducer has failed or the pressure is above the readable range.	Relieve system pressure. Verify connections, or replace if reconnecting does not eliminate the alarm.
QADX	Alarm	Differential Pressure A Over B	Low Differential Pressure	There is a leak on the B side.	Check the system for internal and external leaks on all color manifolds and plumbing.
				The B side pump is cavitating.	Check paint supply on the B side, increase paint supply pressure.
QBDX	Alarm	Differential Pressure B Over A	High Differential Pressure	There is a leak on the A side.	Check the system for internal and external leaks on all color manifolds and plumbing.
				The A side pump is cavitating.	Check paint supply on the A side, increase paint supply pressure.
QPD1	Deviation	Potlife Expired	Potlife time has expired before moving the required amount of material (potlife volume) through the mixed material line.	Purge process was not completed.	Make sure purge process is completed.
				Solvent supply shut off or empty.	Verify solvent supply is available and on, supply valves are open.

Code	Type	Description	Problem	Cause	Solution
SAD1	Alarm	Atomizing Solvent	AFS is active while solvent, diluted material, or an unknown material is in the gun.	Atomizing air supply was not shut off before purging or filling spray gun.	Make sure atomizing air is shut off before purging or filling the spray gun. Use an AA cutoff valve on the atomizing air supply.
SND1	Alarm	Mix Fill Incomplete	The system timed out before completing the mix fill cycle to load the gun with mixed material.	Mix manifold not set to spray position.	Set manifold to spray.
				Spray gun was not triggered.	Allow flow through gun during fill process until the fill complete LED stops flashing.
				Restrictions in mixer, manifold, or spray gun.	Fix restrictions.
SPD1	Alarm	Gun Purge Incomplete	The system timed out without reaching the user-specified volume of solvent for a purge.	Solvent flow switch not working.	Replace switch.
				Solvent flow is too low to actuate the solvent switch.	Increase solvent pressure to drive a high purge flow rate
				Gun is not triggered.	Operator must continue flushing for configured time, until the booth control indicates purge is completed.
				Mix manifold was not set to flush position, blocking solvent flow to the spray gun.	Set manifold to flush position.
WSUX	Advisory	USB Config. Err.	USB configuration file does not match expected, checked on startup.	A software update was not completed successfully.	Reinstall software.
WX00	Alarm	Software Errors	An unexpected software error has occurred.		Call Graco Technical Support.
WXUD	Advisory	USB Download Err.	An error occurred while downloading to the usb drive.	User installed USB device in ADM USB port.	Repeat process.
WXUU	Advisory	USB Upload Err.	An error occurred while uploading from the usb drive.	User installed USB device in ADM USB port.	Repeat process.

Maintenance Error Codes

Perform the required maintenance if the following codes occur.

Code	Type	Name	Description
END#	Record	Calibration Pump #	A calibration test was run on the pump.
ENS0	Record	Calibration Solvent Meter	A calibration test was run on the solvent meter.
ENT#	Record	Calibration Stall Test Pump #	A stall test was completed successfully on pump #.
MAD#	Advisory	Maint. Outlet Pump #	Maintenance is due on pump.
MAT#	Advisory	Maint. Stall Test Pump #	Maintenance stall test is due on pump.
MEB#	Advisory	Maint. Valve Catalyst (B) #	Maintenance is due on catalyst valve.
MED#	Advisory	Maint. Valve Outlet #	Maintenance is due on outlet valve.
MEF#	Advisory	Maint. Valve Inlet #	Maintenance is due on inlet valve.
MEG#	Advisory	Maint. Valve Gun #	Maintenance is due on gun valve.
MES#	Advisory	Maint. Valve Solvent #	Maintenance is due on solvent valve.
MFF#	Advisory	Maint. Meter Flow #	Maintenance is due on flow meter.
MFS0	Advisory	Maint. Meter Solvent	Maintenance stall test is due on solvent meter.
MGH0	Advisory	Maint. Filter Fluid	Maintenance is due on fluid filter.
MGP0	Advisory	Maint. Filter Air	Maintenance is due on air filter.

Booth Control Troubleshooting

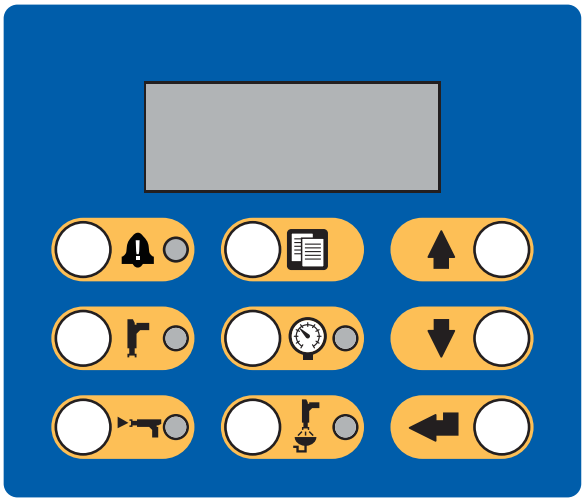


Figure 8 Booth Control

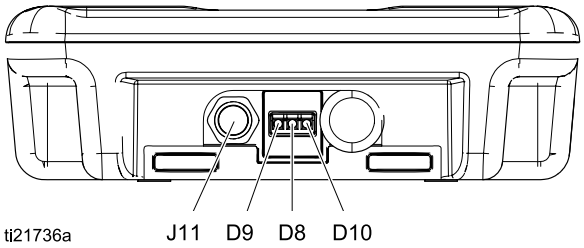


Figure 9 Bottom View of Booth Control

Table 1 . Booth Control Diagnostics

Indicator	Description	Diagnosis
	Mix Mode (green)	LED is on when in Mix mode. LED blinks when in Mix Fill mode. Also blinks is Mix Idle mode (together with Standby LED).
	Purge Mode (green)	LED is on when in Purge mode. LED blinks when a purge is needed.
	Pressure Change Mode (green)	LED blinks when in Pressure Change mode.
	Alarm (red)	LED is on steady when any event has been acknowledged. LED blinks when any event has not been acknowledged. LED turns off after the event is cleared.
	Standby Mode (green)	LED is on steady when in Standby mode. LED blinks when in Color Change, Startup, Shutdown, Prime Pump, Fill, Calibration, Maintenance, and during Pump Pressure Check. Also blinks is Mix Idle mode (together with Mix LED).
D8	Heartbeat (green)	LED blinks during normal operation.
D9	Communication (yellow)	LED turns on when board is communication with isolation board in electronic control.
D10	Power (green)	LED turns on when power is supplied to the board (connector J11).
J11	Connector	Power/CAN connector.

Power Barrier Board Troubleshooting

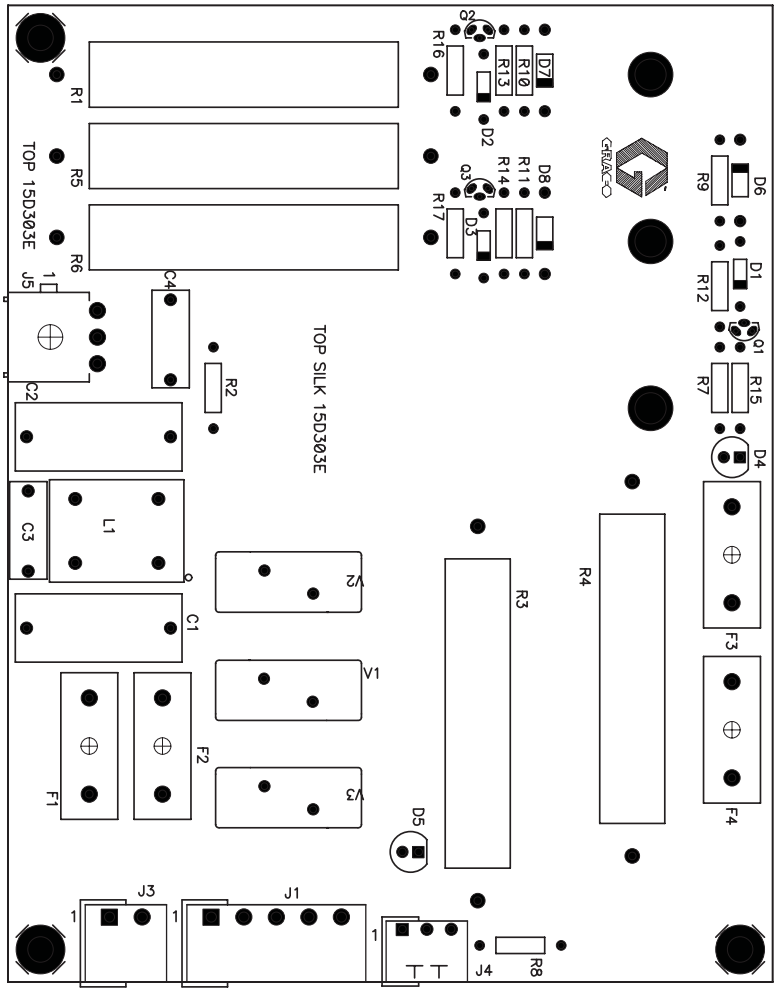


Figure 10 Power Barrier Board

Table 2 . Power Barrier Board Diagnostics

Component or Indicator	Description	Diagnosis
D4	LED (green)	IS Power
D5	LED (green)	Power
F3	Fuse, 400 mA, 250 V	If either F3 or F4 is blown, there is no power to the IS location. D4 is out.
F4	Fuse, 400 mA, 250 V	
J4	Connector, 24 Vdc power input	
J5	Connector, +12 Vdc intrinsically safe power output	

Isolation Board Troubleshooting

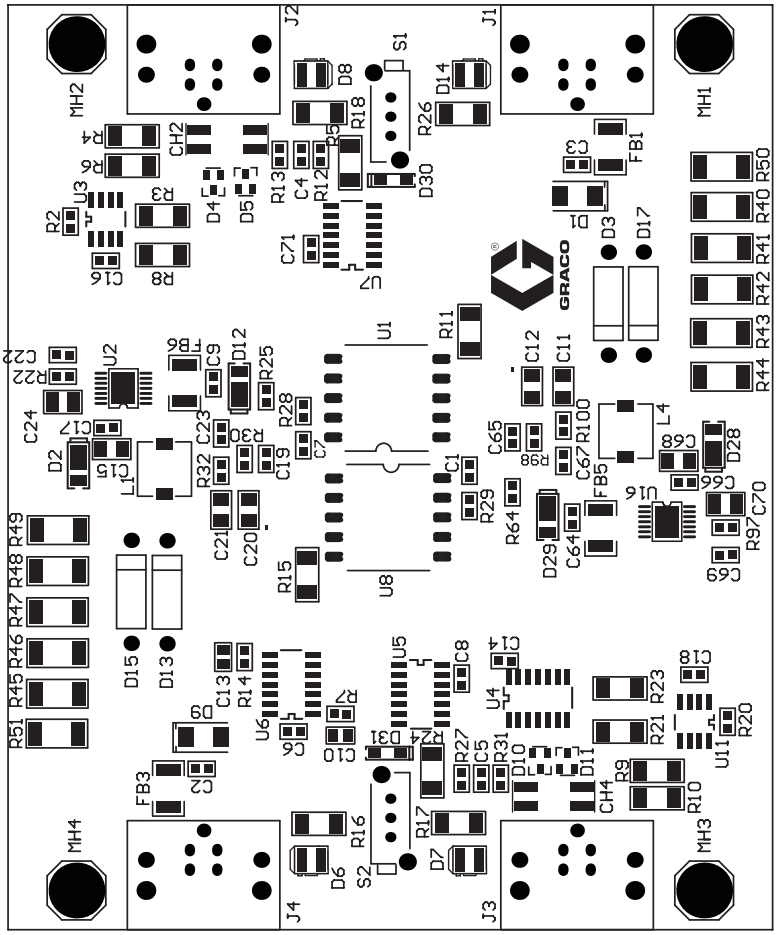
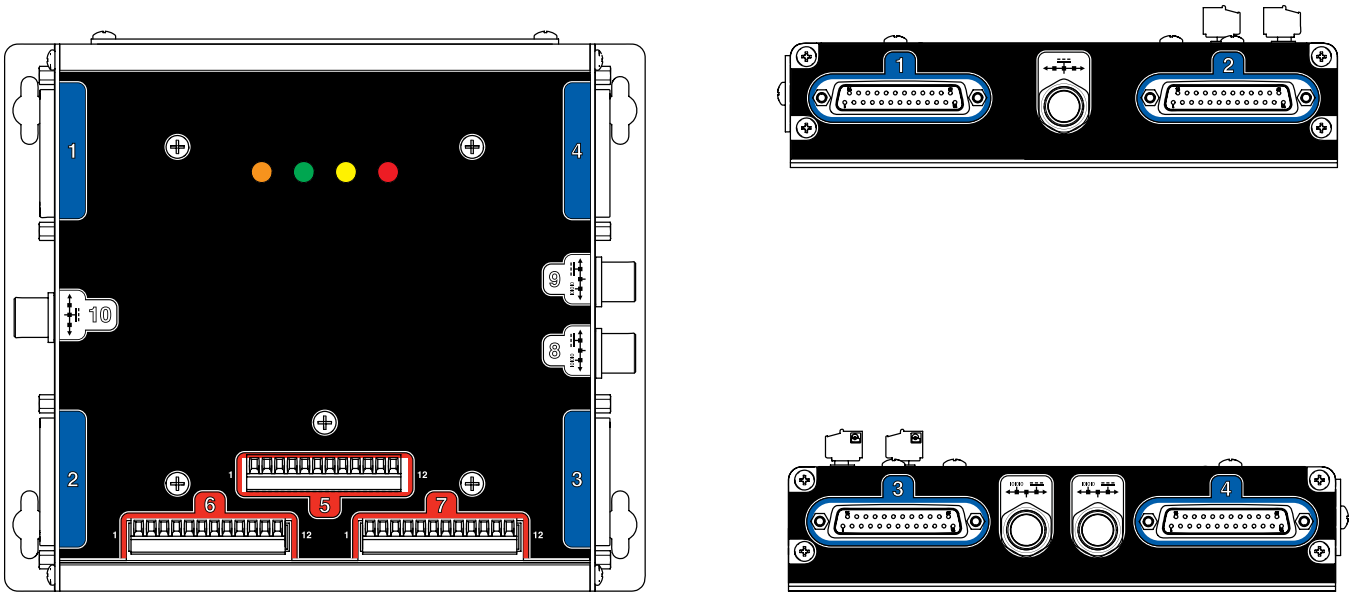


Figure 11 Isolation Board

Table 3 . Isolation Board Diagnostics

Component or Indicator	Description	Diagnosis
D6	LED (yellow)	IS Communication
D7	LED (green)	IS Power
D8	LED (green)	Non-IS Power
D14	LED (yellow)	Non-IS Communication
J1	Connector	Non-IS
J2	Connector	Non-IS
J3	Connector	Intrinsically Safe
J4	Connector	Intrinsically Safe
S1	Pushbutton Switch	For Non IS connectors. If switch S1 is off, yellow LED (D14) is steady on. Push switch to turn switch on.
S2	Pushbutton Switch	For Intrinsically Safe connectors. If switch S2 is off, yellow LED (D6) is steady on. Push switch to turn switch on.

Enhanced Fluid Control Module Troubleshooting



ti21742a

Figure 12 Enhanced Fluid Control Module

Table 4 . Enhanced Fluid Control Module Diagnostics

Connector or Indicator	Description	Diagnosis
1	25 pin connector	Pump 1 Module
2	25 pin connector	Pump 2 Module
3	25 pin connector	Pump 3 Module (accessory)
4	25 pin connector	Pump 4 Module (accessory)
5	12 pin connector	Multiple purpose I/O
6	12 pin connector	Multiple purpose I/O
7	12 pin connector	Multiple purpose I/O
8	5 pin connector	24 Vdc Power/CAN (Communication Barrier)
9	5 pin connector	Advanced Display Module
10	5 pin connector	24 Vdc Input
CPLD (D37)	LED (orange)	Heartbeat
POW (D19)	LED (green)	Power
CAN (D69)	LED (yellow)	Communication.
ERR (D38)	LED (red)	Blinks an error code. If the LED is on steady, the system is down. Cycle power.

Pump Module Troubleshooting

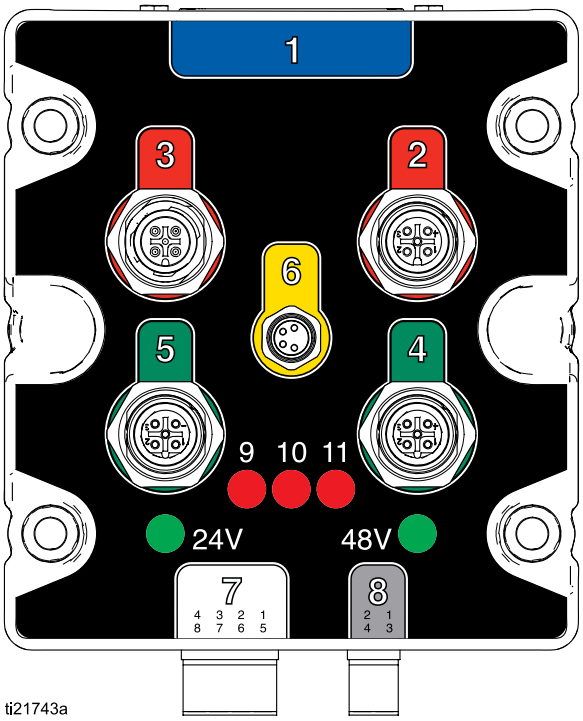


Figure 13 Pump Module

Table 5 . Pump Module Diagnostics

Component or Indicator	Description	Diagnosis
1	25 pin connector	Input from EFCM
2	5 pin connector	Pump connection
3	5 pin connector	Encoder connection
4	5 pin connector	Pump Inlet Transducer
5	5 pin connector	Pump Outlet Transducer
6	4 pin connector	Not used
7	8 pin connector	Dose Valve Solenoids
8	4 pin connector	48 Vdc Input Power and fan connection
9	LED (red)	Pump Up Valve Output
10	LED (red)	Pump Down Valve Output
11	LED (red)	Not used
24V	LED (green)	24 Vdc power supplied
48V	LED (green)	48 Vdc power supplied

Advanced Display Module Troubleshooting

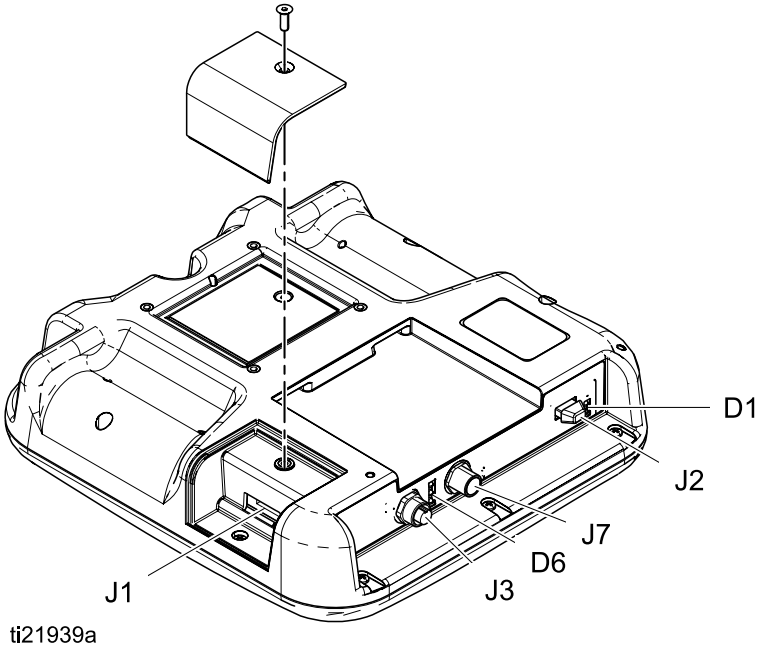


Figure 14 Advanced Display Module

Table 6 . Advanced Display Module Diagnostics

Connector or Indicator	Description	Diagnosis
D1	LED (yellow/green)	Green: USB inserted Yellow: USB communication
D6	LED (red/yellow/green)	Green: Power Yellow: Communication Red: Error
J1	8 pin connector	Token port
J2	8 pin connector	USB port
J3	5 pin connector	Light tower (accessory)
J7	5 pin connector	CAN power/communication port

Notes

Electrical Schematics

NOTE: The electrical schematic illustrates all possible wiring expansions in a ProMix PD2K system. Some components shown are not included with all systems.
NOTE: See Optional Cables and Modules, page 35 for a list of cable options.

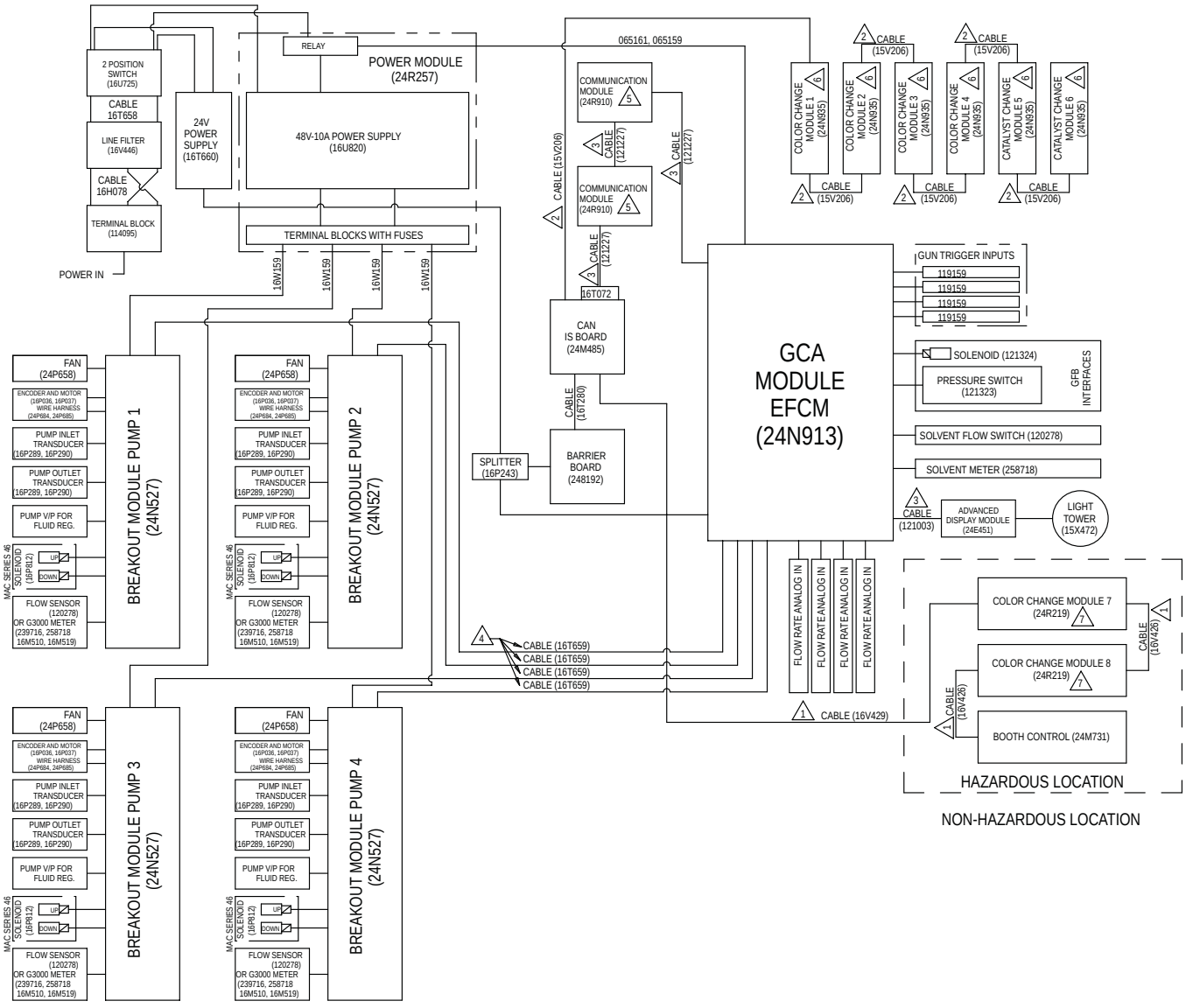


Figure 15 Electrical Schematic, Sheet 1

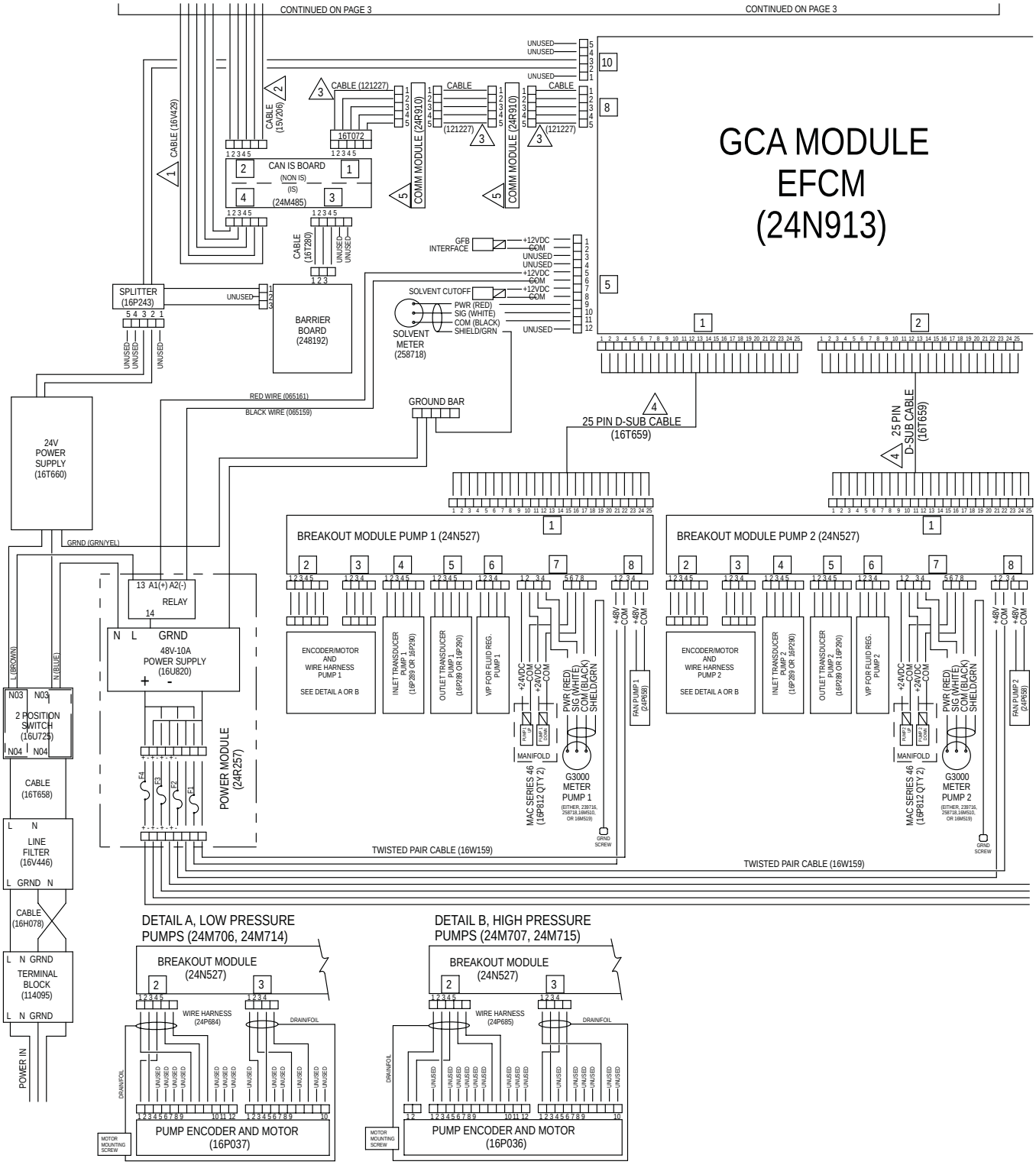


Figure 16 Electrical Schematic, Sheet 2, Part 1

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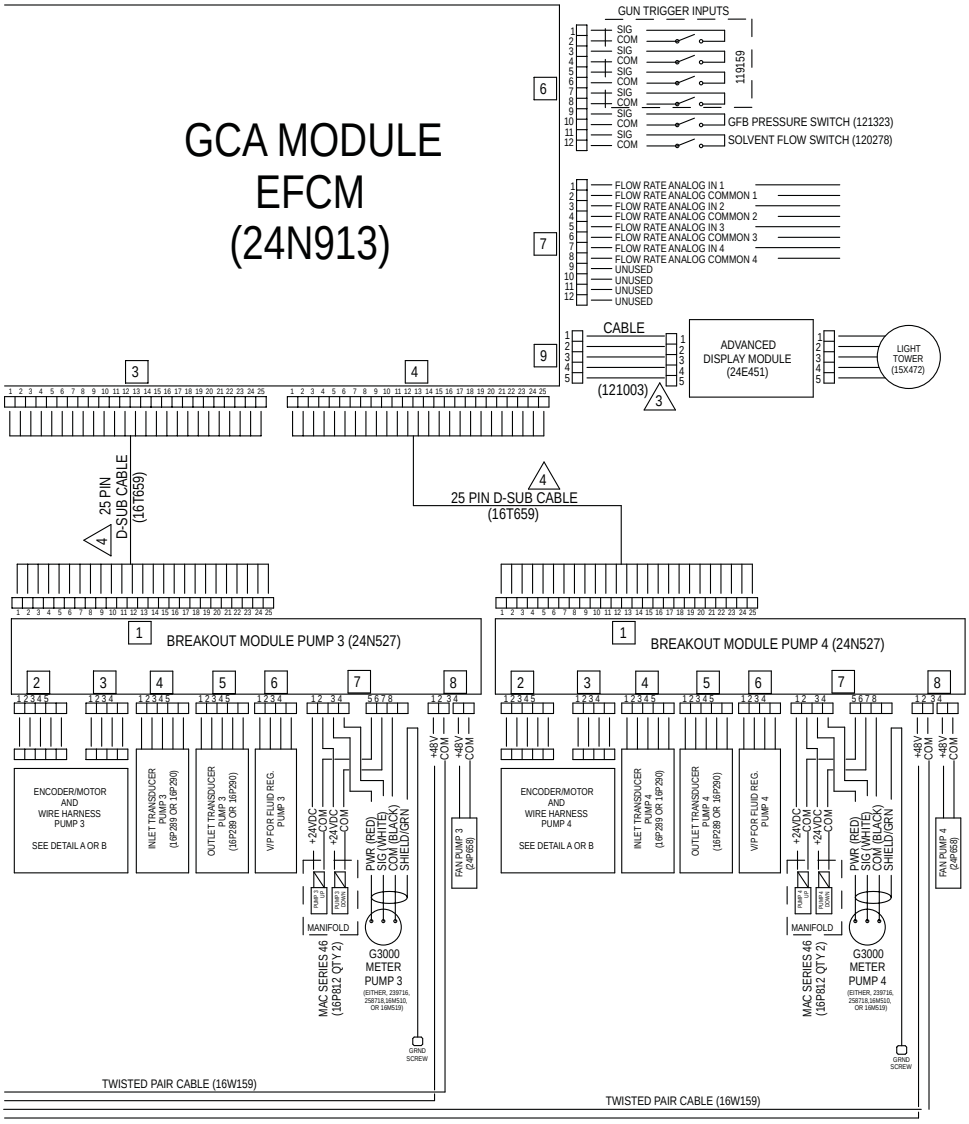

Figure 17 Electrical Schematic, Sheet 2, Part 2

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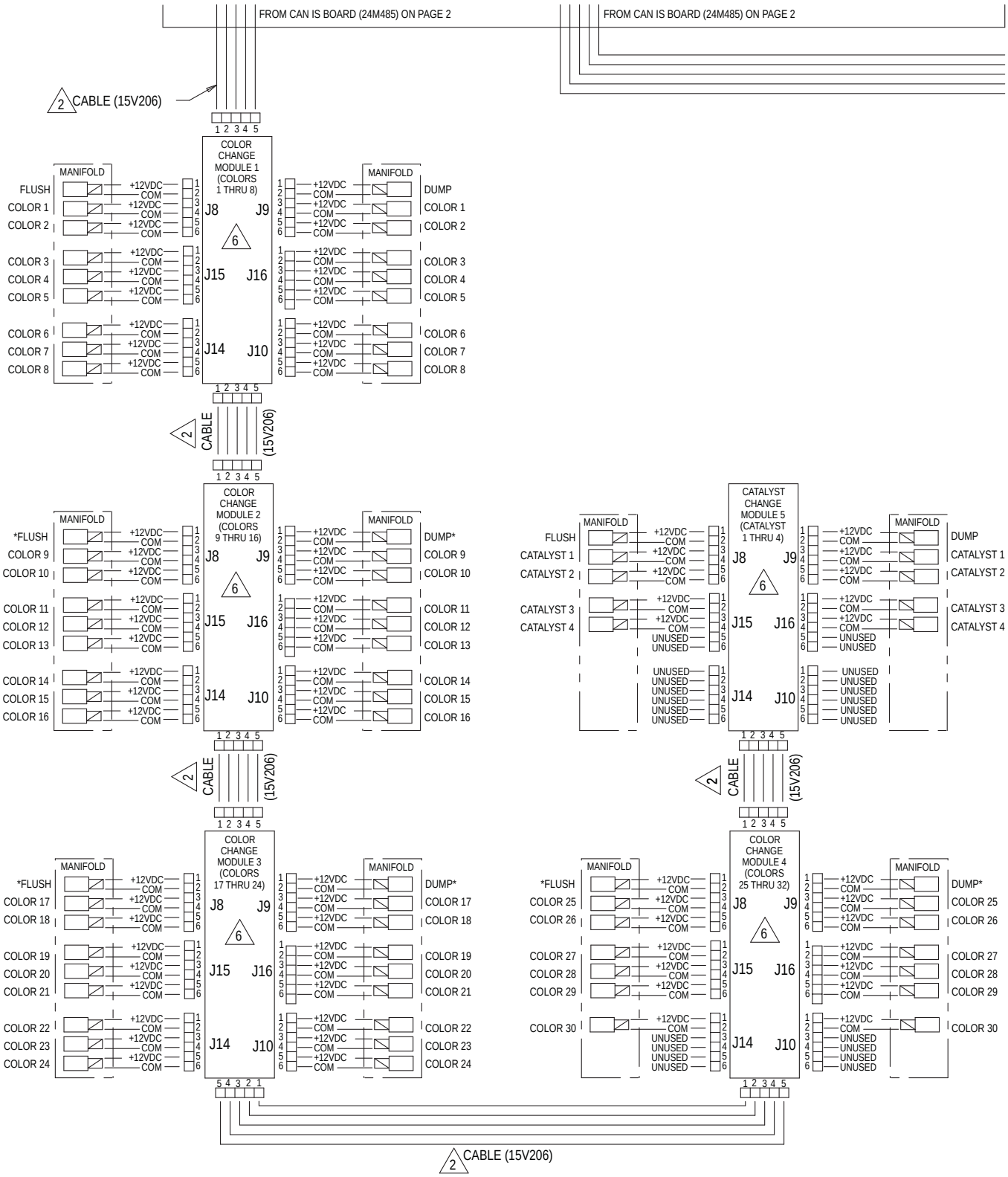

Figure 18 Electrical Schematic, Sheet 3

* May be unused in some configurations.

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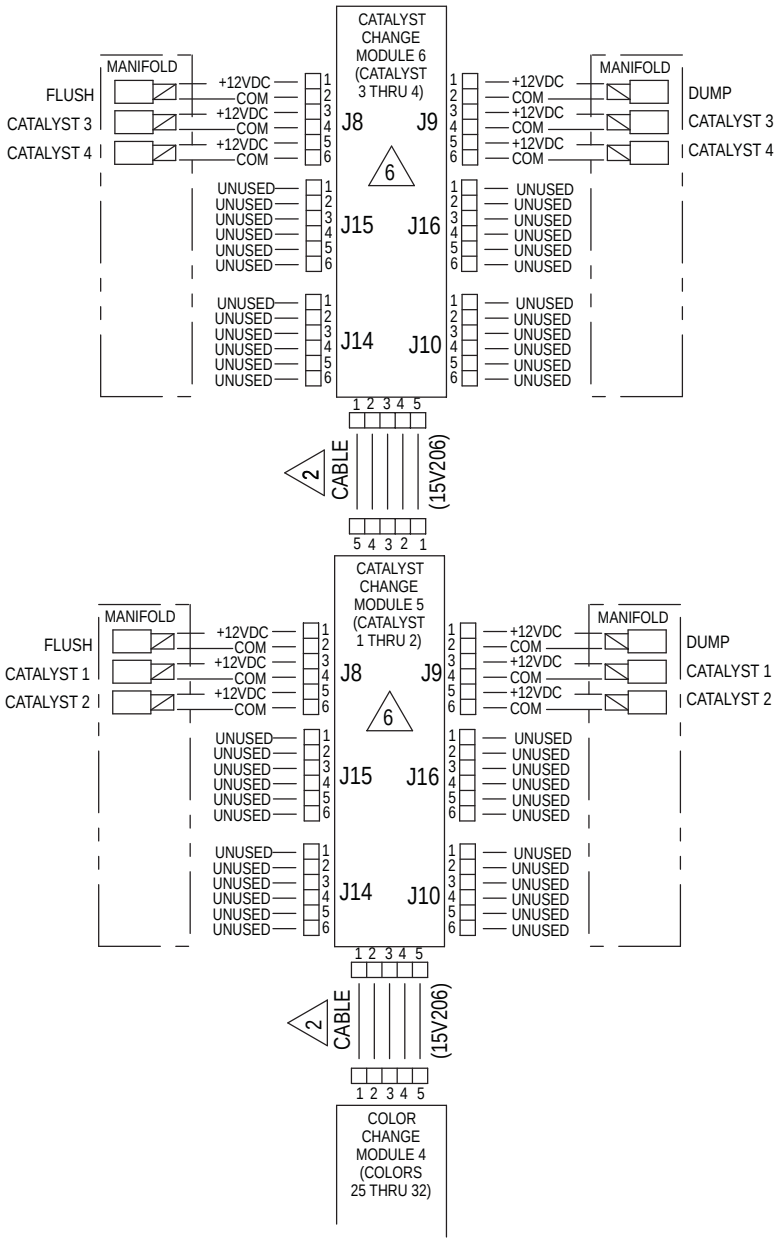

Figure 19 Electrical Schematic, Sheet 3, Alternate Configuration for Catalyst Change Control

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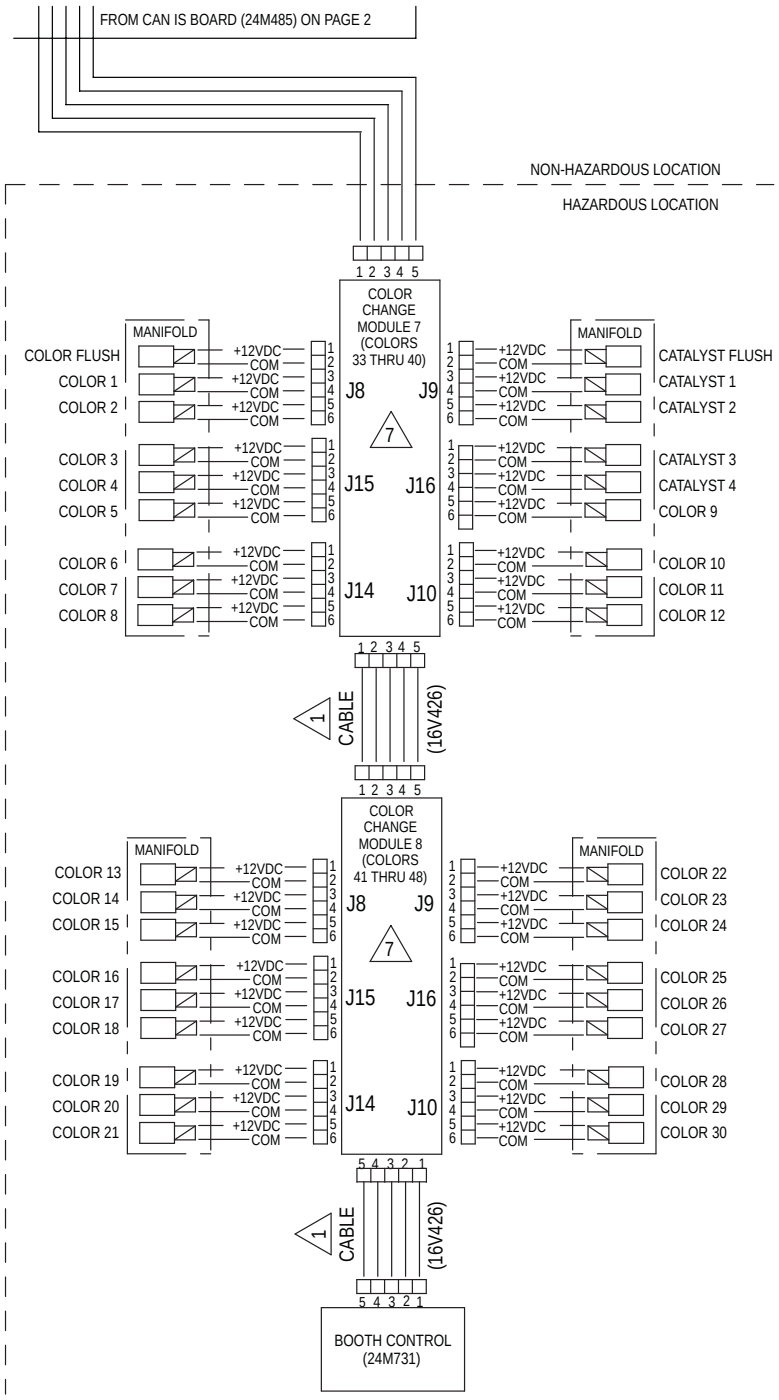


Figure 20 Electrical Schematic, Sheet 3, Hazardous Location

Optional Cables and Modules

NOTE: The total length of all cable used in the system must not exceed 150 ft (45 m). See the Electrical Schematics, page 29.

1 M12 CAN Cables, for Hazardous Locations **NOTE:** The total length of cable used in the hazardous location must not exceed 120 ft (36 m).	
Cable Part No.	**Length ft (m)**
16V423	2.0 (0.6)
16V424	3.0 (1.0)
16V425	6.0 (2.0)
16V426	10.0 (3.0)
16V427	15.0 (5.0)
16V428	25.0 (8.0)
16V429	50.0 (16.0)
16V430	100.0 (32.0)

2 M12 CAN Cables, for Non-Hazardous Locations Only	
15U531	2.0 (0.6)
15U532	3.0 (1.0)
15V205	6.0 (2.0)
15V206	10.0 (3.0)
15V207	15.0 (5.0)
15V208	25.0 (8.0)
15U533	50.0 (16.0)
15V213	100.0 (32.0)

5 Alternates for Communication Module 24R910, for Non-Hazardous Locations Only	
Module Part No.	**Module Part No.**
15V759	15V761
15V760	15V762

3 CAN Cables, for Non-Hazardous Locations Only	
Cable Part No.	**Length ft (m)**
125306	1.0 (0.3)
123422	1.3 (0.4)
121000	1.6 (0.5)
121227	2.0 (0.6)
121001	3.0 (1.0)
121002	5.0 (1.5)
121003	10.0 (3.0)
120952	13.0 (4.0)
121201	20.0 (6.0)
121004	25.0 (8.0)
121228	50.0 (15.0)

4 25 Pin D-SUB Cables, for Non-Hazardous Locations Only	
16T659	2.5 (0.8)
16V659	6.0 (1.8)

6 Alternates for Color Change Modules by Part Number (Factory Configuration), for Non-Hazardous Locations Only	
Module Part No.	**Description**
24T557	2 color/2 catalyst
24T558	4 color/4 catalyst
24T559	6 color/6 catalyst
24T560	8 color/8 catalyst

7 Alternates for Color Change Modules by Part Number (Factory Configuration), for Hazardous Locations Only	
24T571	2 color/2 catalyst
24T572	4 color/2 catalyst
24T573	6 color/2 catalyst
24T574	8 color/2 catalyst

Repair

Before Servicing

- Servicing the electrical control box exposes you to high voltage. To avoid electric shock, turn off power at the main circuit breaker before opening the enclosure.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.
- Do not substitute or modify system components as this may impair intrinsic safety.

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Flush the system as explained in your PD2K Operation Manual if service time may exceed pot life time. Follow the Pressure Relief Procedure, page 37 before servicing fluid components.
2. Close the main air shutoff valve on the air supply line.
3. Shut off the power switch (P) at the electrical control box.
4. If servicing the electrical control box, shut off power at the main circuit breaker before opening the enclosure.

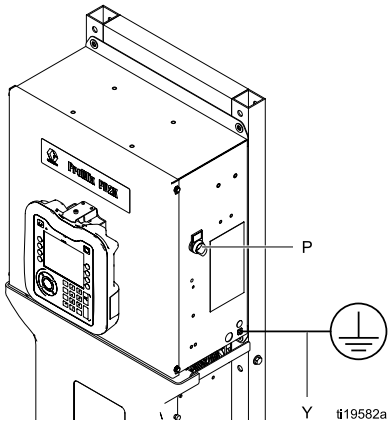


Figure 21 Control Box Power Switch

Pressure Relief Procedure

Follow the **Pressure Relief Procedure** whenever you see this symbol.

This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the **Pressure Relief Procedure** when you stop spraying and before cleaning, checking, or servicing the equipment.

Without Color Change

NOTE: The following procedure relieves all fluid and air pressure in the system.

1. Turn off the supply pumps. Open the drain valve on the supply line fluid filter to relieve pressure in the supply line.

   NOTE: If your system does not include a drain valve on the supply line, set the mix manifold to SPRAY and press . Cycle the A and B dosing pumps a couple of times to drain the pumps.

2. Press Standby . Trigger the gun to relieve pressure.
3. Set the mix manifold to FLUSH. Flush the mix manifold and gun. See Flush Mixed Material in the PD2K Operation Manual.
4. Shut off the solvent supply pump. To relieve pressure, press Purge and trigger the gun. Press Standby when pressure is relieved, to avoid getting a Purge Incomplete alarm.

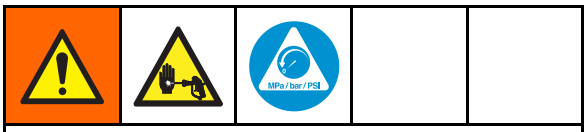
NOTE: If pressure remains in the solvent line between the solvent supply pump and the solvent valve, VERY SLOWLY loosen a fitting to relieve pressure gradually.

With Color Change

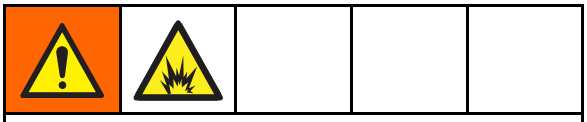
NOTE: The following procedure relieves all fluid and air pressure in the system.

1. Turn off the supply pumps. Open the drain valve on the supply line fluid filter to relieve pressure in the supply lines. Do this for each color.

   NOTE: If your system does not include a drain valve on the supply line, set the mix manifold to SPRAY and press . Cycle the A and B dosing pumps a couple of times to drain the pumps. Repeat for each color.



If you are using a high pressure gun, engage the trigger lock. Remove the spray tip and clean it separately.



If using an electrostatic gun, shut off the electrostatics before flushing the gun.

2. Set the mix manifold to SPRAY. Trigger the gun to relieve pressure. Repeat for each color.
3. Press Purge . Repeat for each color. Hold the gun trigger open after the solvent valve shuts off to relieve all pressure.
4. Set the system to Recipe 0 to flush the system from the pumps to the gun. When flushing is complete the system will go to Standby.
5. Shut off the solvent supply pump. To relieve pressure, press Purge and trigger the gun. Press Standby when pressure is relieved, to avoid getting a Purge Incomplete alarm.

NOTE: If pressure remains in the solvent line between the solvent supply pump and the solvent valve, VERY SLOWLY loosen a fitting to relieve pressure gradually.

Repairing the Advanced Display Module (ADM)

To replace the Advanced Display Module, disconnect the cable from the module and remove the module from the bracket. Install the new module on the bracket and attach the cable.

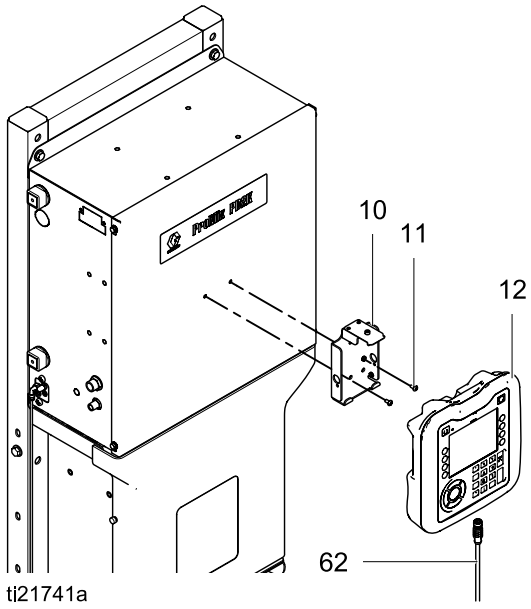


Figure 22 Replace the Advanced Display Module

Install Key Token or Upgrade Token

1. Shut off the PD2K power switch.
2. Remove the token access panel.

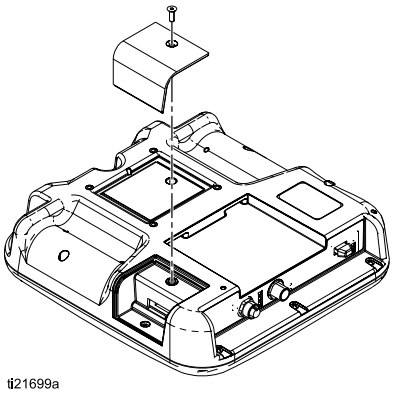


Figure 23 Remove Token Access Panel

3. Insert and press token (T) firmly into slot.

   NOTE: There is no preferred orientation of the token.

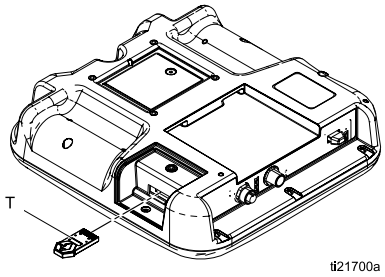
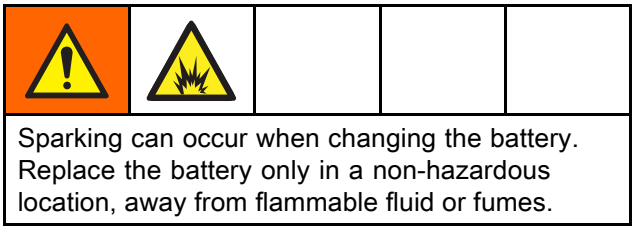


Figure 24 Insert Token

4. Turn the power switch back on. The red indicator light (L) will flash until the new firmware is completely loaded.
5. Remove the token (T).
6. Replace the token access panel.

Replace the Battery

A lithium battery maintains the ADM clock when the power is not connected.



Sparking can occur when changing the battery. Replace the battery only in a non-hazardous location, away from flammable fluid or fumes.

1. Turn off the PD2K power switch.
2. Remove the rear access panel.

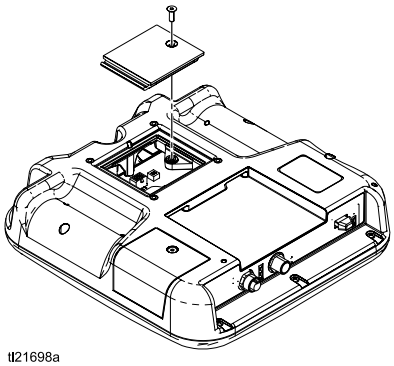


Figure 25 Remove Battery Panel

3. Remove the old battery and replace with a new CR2032 battery.
4. Replace the rear access panel.
5. Turn the power switch on.

Servicing the Control Box

Replacing the Isolation Board

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Loosen the screws (124) and remove the enclosure cover (117).
3. Note the position of the isolation board cables. See the following table and Electrical Schematics, page 29. Disconnect the cables from the isolation board (111). Remove the brackets (110).

Isolation Board Connector	Cable Destination
J1 (non-intrinsically safe)	EFCM
J2 (non-intrinsically safe)	Optional Color Change Module
J3 (intrinsically safe)	Barrier Board
J4 (intrinsically safe)	Booth Control

4. Remove the screws (128) holding the isolation board (111) to the barrier cover (107). Remove the isolation board.
5. Install the new isolation board, using the screws (128).
6. Install the brackets (110). Reconnect the cables to the positions as noted above.
7. Turn on power at the main circuit breaker.
8. Turn on the control box power switch. Check that the two green LEDs (D7, D8) and two yellow LEDs (D6, D14) are on.
9. Reinstall the cover (117) and tighten the screws (124).

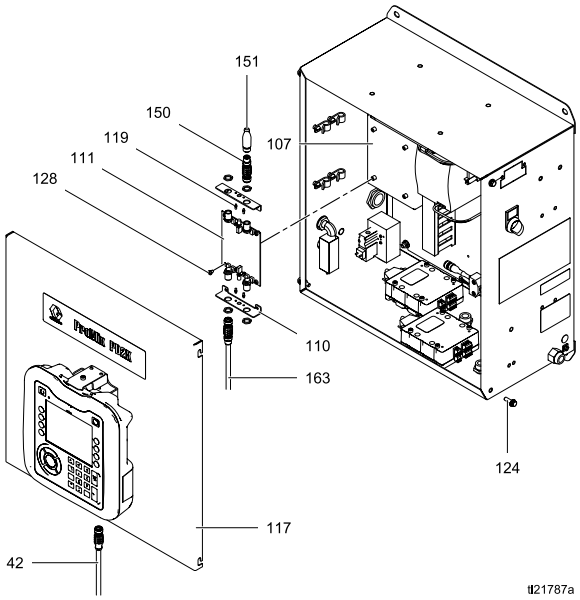


Figure 26 Replacing the Isolation Board

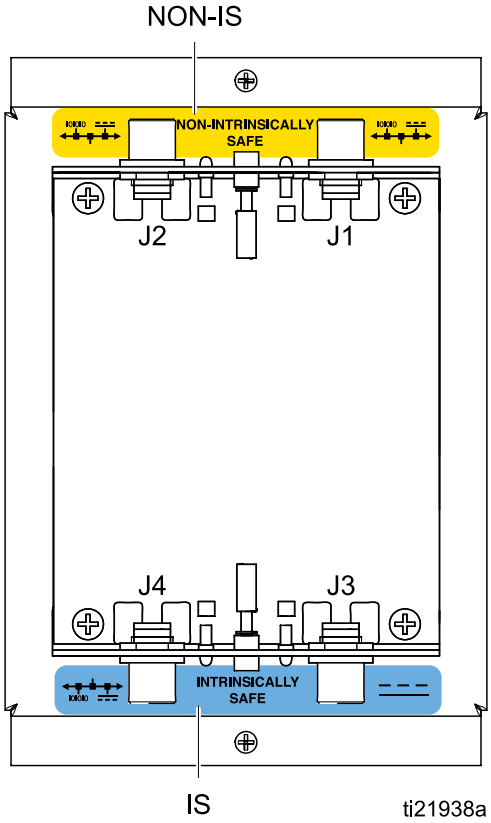


Figure 27 Detail of Isolation Board Cable Connections

Replacing the Barrier Board

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Loosen the screws (124) and remove the enclosure cover (117).
3. Loosen the screws (125) and remove the barrier cover (107), leaving the isolation board (111) attached to the cover.
4. Note the position of the barrier board input and output cables. See Electrical Schematics, page 29. Disconnect the cables from the barrier board (106).
5. Remove the two screws (108), and the three screws (109), spacers (105), and lockwashers (104). Remove the barrier board (106).
6. Install the new barrier board, using the screws, spacers, and lockwashers.
7. Reconnect the cables to the barrier board, as noted above.
8. Install the barrier cover (107) and isolation board (111).
9. Turn on power at the main circuit breaker.
10. Turn on the control box power switch. Check that the system is operating.

    NOTE: The two green LEDs (D4, D5) on the barrier board will light if the board has power.

11. Reinstall the cover (117) and tighten the screws (124).

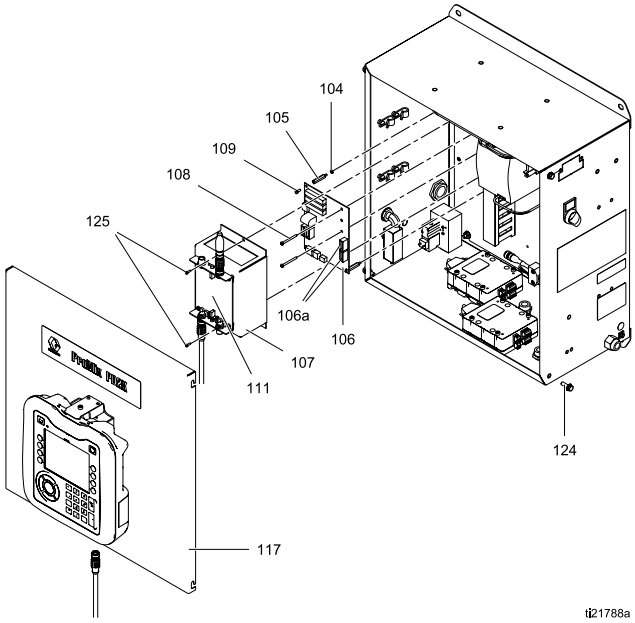


Figure 28 Replacing the Barrier Board

Replacing the Barrier Board Fuses

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow steps 1–4 under Replacing the Barrier Board, page 40.
2. Remove the fuse (F3 or F4) from its fuseholder.
3. Snap the new fuse into the fuseholder.
4. Follow steps 7–11 under Replacing the Barrier Board, page 40.

Replacing the EFCM Control Module

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Loosen the screws (124) and remove the enclosure cover (117, not shown).
3. Note the position of the EFCM input and output cables. See Electrical Schematics, page 29. Disconnect the cables from the EFCM (139).
4. Loosen the screws (142) holding the EFCM to the enclosure. Remove the module.
5. Install the new EFCM, using the screws (142).
6. Reconnect the cables to the positions as noted above.
7. Turn on power at the main circuit breaker.
8. Load the software. See Install Key Token or Upgrade Token, page 38.
9. Turn on the control box power switch. Check that the green is on, the orange and yellow LEDs are blinking, and the red LED is off.
10. Reinstall the cover (117) and tighten the screws (124).

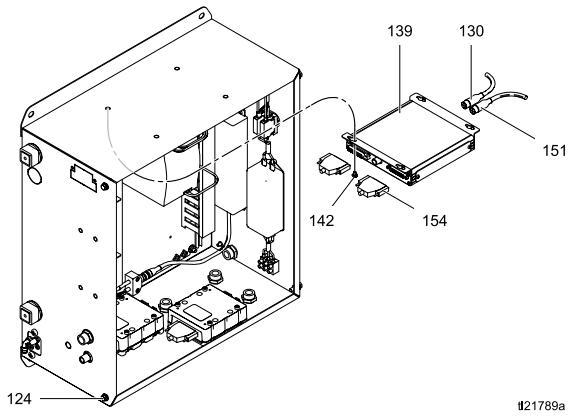


Figure 29 Replacing the EFCM Control Module

Replacing the 24 Vdc Power Supply

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Loosen the screws (124) and remove the enclosure cover (117, not shown).
3. Note the position of the power supply input and output wires. See Electrical Schematics, page 29. Disconnect the wires from the power supply (120).
4. Remove the screws (129) holding the power supply to the side of the enclosure. Remove the power supply.
5. Install the new power supply, using the screws (129).
6. Reconnect the wires to the positions as noted above.
7. Reinstall the cover (117) and tighten the screws (124).
8. Turn on power at the main circuit breaker.
9. Turn on the control box power switch.

   NOTE: The green LED on the barrier board (106), the green power LED on the EFCM module (139), and the 24V green LED on each of the pump control modules (132) will light when operating.

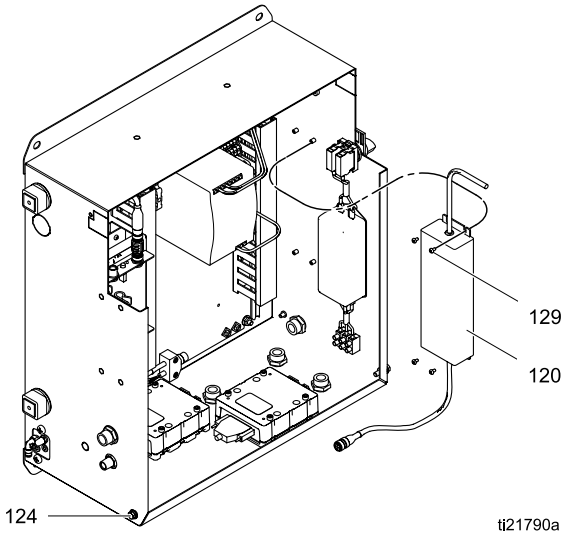


Figure 30 Replacing the 24 Vdc Power Supply

Replacing the 48 Vdc Pump Power Supply

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Loosen the screws (124) and remove the enclosure cover (117).
3. Note the position of the power supply input and output wires. See Electrical Schematics, page 29. Disconnect the wires from the power supply (103).
4. Remove the screws (128) holding the power supply din rail to the enclosure. Remove the entire assembly, mounted to the din rail.
5. Install the new power supply assembly, using the screws (128).
6. Reconnect the wires to the positions as noted above.
7. Reinstall the cover (117) and tighten the screws (124).
8. Turn on power at the main circuit breaker.
9. Turn on the control box power switch. Press to turn pump power on.

   NOTE: The 48V green LED on each of the pump control modules (132) will light when operating.

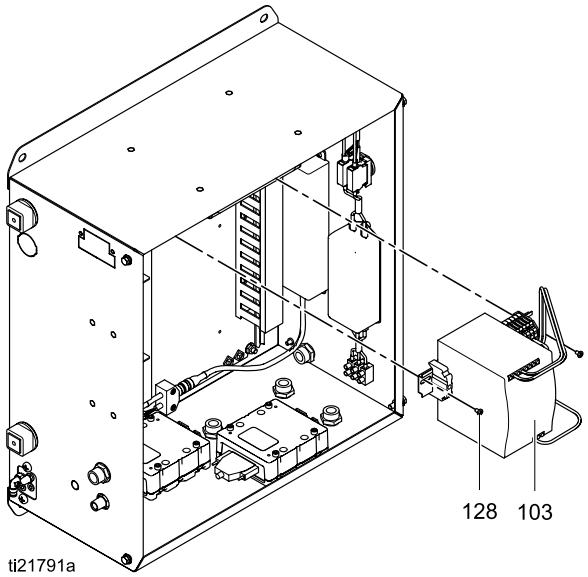


Figure 31 Replacing the 48 Vdc Power Supply

Replacing a Pump Control Module

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Loosen the screws (124) and remove the enclosure cover (117).
3. Note the position of the pump control module input and output cables. See Electrical Schematics, page 29. Disconnect the cables from the pump control module (132).
4. Remove the screws (143) holding the pump control module to the enclosure. Remove the pump control module.
5. Install the new pump control module, using the screws (143).
6. Reconnect the cables to the positions as noted above.
7. Turn on power at the main circuit breaker.
8. Turn on the control box power switch. Check that the 48V green LED and the 24V green LED on each of the pump control modules (132) are on.
9. Reinstall the cover (117) and tighten the screws (124).

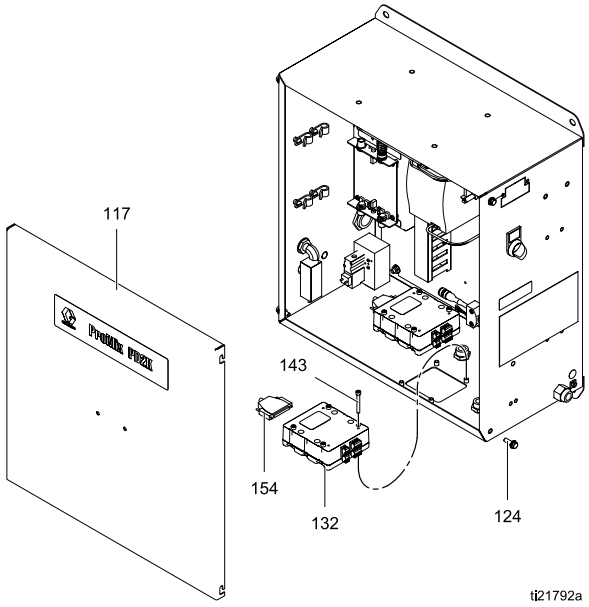


Figure 32 Replacing a Pump Control Module

Replacing the Line Filter

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Loosen the screws (124) and remove the enclosure cover (117).
3. Note the position of the line filter input and output wires. See Electrical Schematics, page 29. Disconnect the wires from the line filter (115).
4. Remove the screws (142) holding the line filter to the enclosure. Remove the line filter.
5. Install the new line filter, using the screws (142).
6. Reconnect the wires to the positions as noted above.
7. Reinstall the cover (117) and tighten the screws (124).
8. Turn on power at the main circuit breaker.

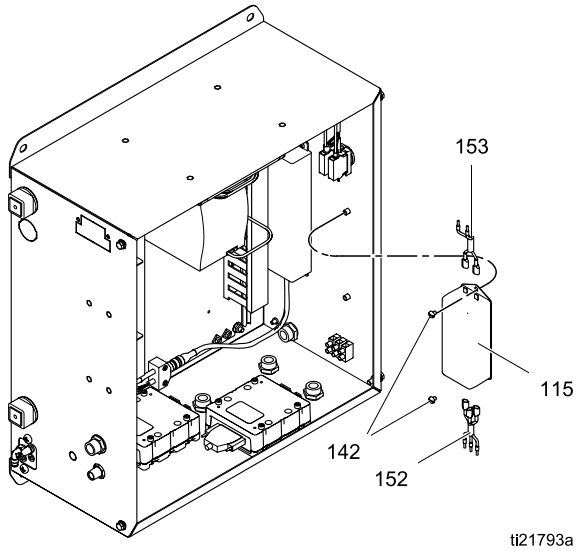


Figure 33 Replacing the Line Filter

Replacing the Power Switch

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Loosen the screws (124) and remove the enclosure cover (117).
3. Note the position of the power switch input and output wires. See Electrical Schematics, page 29. Disconnect the wires from the power switch (112).
4. Remove the switch terminal blocks, unscrew the retaining nut, and remove the switch.
5. Install the new switch.
6. Reconnect the wires to the positions as noted above.
7. Reinstall the cover (117) and tighten the screws (124).
8. Turn on power at the main circuit breaker.

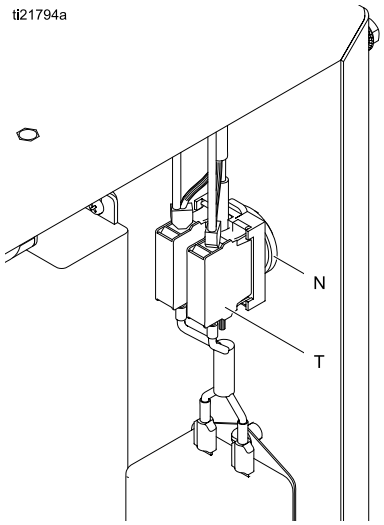


Figure 34 Replacing the Power Switch

Replacing the Air Flow Switch

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Loosen the screws (124) and remove the enclosure cover (117).
3. Disconnect the air flow switch wires from J6 pins 1–2 on the EFCM. See Electrical Schematics, page 29.
4. Disconnect the air lines.
5. Remove the air flow switch (159) and attaching hardware from the side of the control box.
6. Install a new air flow switch. Connect the wires to J6 pins 1–2. Reconnect the air lines.
7. Reinstall the cover (117) and tighten the screws (124).
8. Turn on power at the main circuit breaker.
9. Turn on the control box power switch.

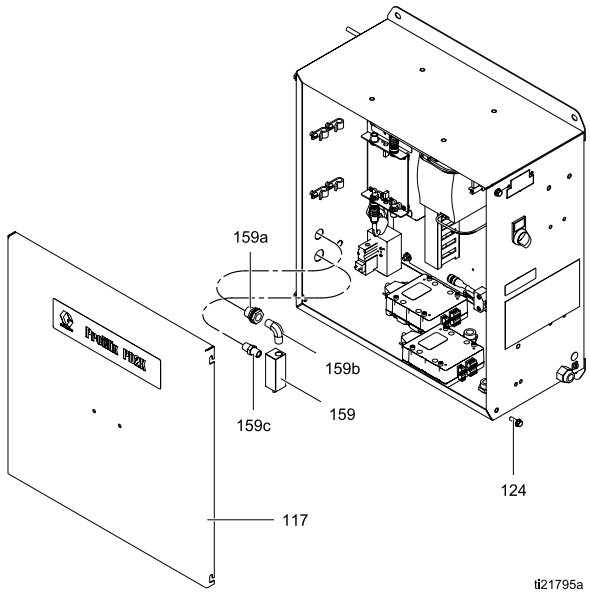


Figure 35 Replacing the Air Flow Switch

Servicing the Fluid Section

Removing a Pump

1. Follow the steps in Before Servicing, page 36.
2. Remove the screws (56) holding the cover (8) to the front of the unit.
3. Disconnect the cable from the pump driver (101).
4. Disconnect the air lines from the dosing valves (V).
5. Disconnect the fluid inlet and outlet lines from the pump manifolds (IN, OUT).
6. Remove the screws (15) and pump bracket (7).
7. Loosen the jam nuts holding the pump to the mounting bracket (4). Remove the pump.
8. See manual 332339 to repair the pump.

Installing a Pump

1. Slide the pump into the mounting bracket (4). Tighten the jam nuts to secure.
2. Install the pump bracket (7) and screws (15).
3. Connect the fluid inlet and outlet lines to the pump manifolds (IN, OUT).
4. Connect the air lines to the dosing valves (V).
5. Connect the cable to the pump driver (101).
6. Install the cover (8) to the front of the unit with the screws (56).
7. Open the main air shutoff valve on the air supply line.
8. Restore power to the unit. Turn on the power switch at the electrical control box.

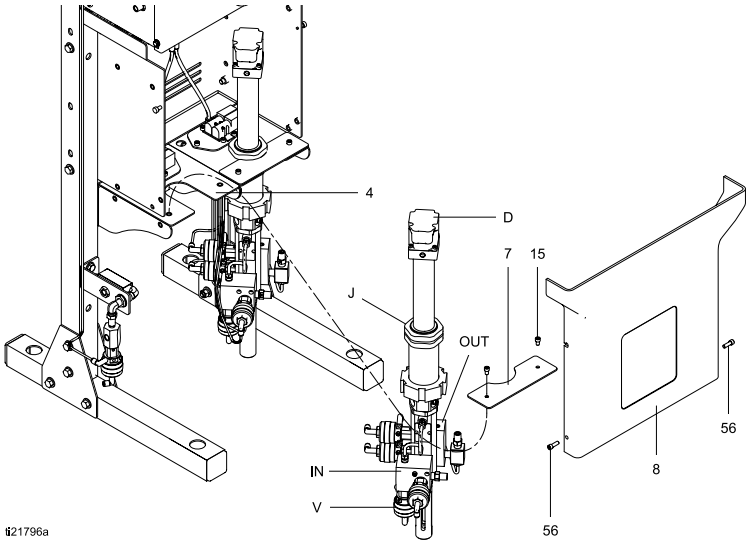


Figure 36 Installing a Pump

Replacing a Solenoid

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Remove the screws (56) holding the cover (8) to the front of the unit.
3. Loosen the screws (124) and remove the enclosure cover (117).
4. Disconnect the 2 solenoid wires from J1 on the pump control module. See Electrical Schematics, page 29.
5. Remove 2 screws (303) and the solenoid (305).
6. Install the new solenoid (305) with the screws (303).
7. Connect the 2 solenoid wires to J1 on the pump control module. See Electrical Schematics, page 29.
8. Replace the covers (8, 117).

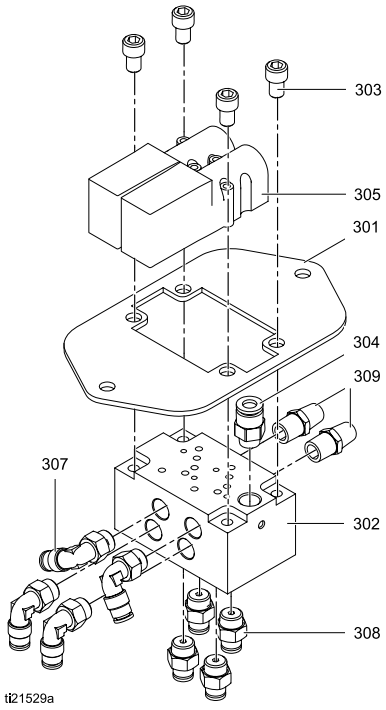


Figure 37 Solenoid Replacement

Replacing a Fan

NOTICE

To avoid damaging the circuit boards when servicing the control box, wear Part No. 112190 grounding strap on your wrist and ground appropriately.

To avoid electrical component damage, remove all system power before plugging any connectors.

1. Follow the steps in Before Servicing, page 36.
2. Remove the screws (56) holding the cover (8) to the front of the unit.
3. Loosen the screws (124) and remove the enclosure cover (117).
4. Disconnect the 2 fan wires from the pump control module. See Electrical Schematics, page 29.
5. Remove the 4 screws, nuts, and washers.
6. Install the new fan and attaching hardware.
7. Connect the 2 fan wires to the pump control module. See Electrical Schematics, page 29.
8. Replace the covers (8, 117).

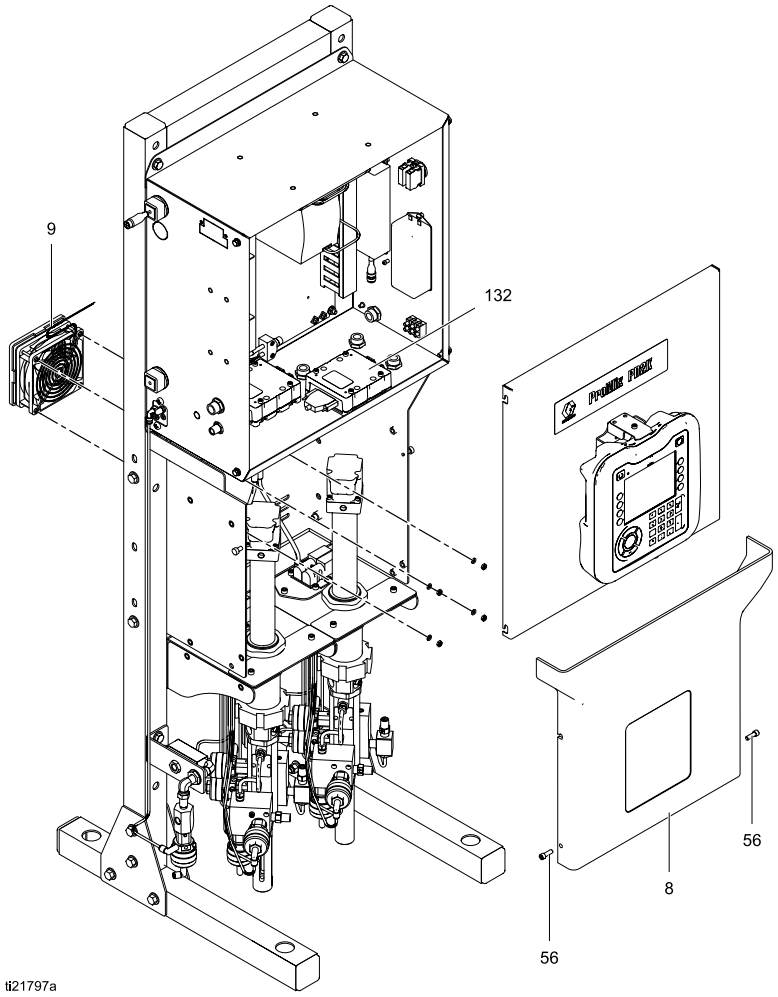


Figure 38 Replacing a Fan

Replacing the Solvent Flow Switch

1. Follow the steps in Before Servicing, page 36.
2. Remove the screws (56) holding the cover (8) to the front of the unit.
3. Disconnect the solvent flow switch wires from J6 pins 11–12 on the EFCM. See Electrical Schematics, page 29.
4. Disconnect the solvent lines.
5. Unscrew the adapter (45) from the solvent flow switch (19).
6. Unscrew the solvent flow switch from the elbow (18).
7. Remove the solvent flow switch (159).
8. Screw the new solvent flow switch onto the elbow (18).
9. Screw the adapter (45) into the solvent flow switch (19).
10. Connect the wires to J6 pins 11–12. Reconnect the solvent lines.
11. Install the cover (8) to the front of the unit with the screws (56).
12. Open the main air shutoff valve on the air supply line.
13. Restore power to the unit. Turn on the power switch (P) at the electrical control box.

Replacing the Solvent Valve

1. Follow the steps in Before Servicing, page 36.
2. Disconnect the air lines from the solvent valve (25).
3. Disconnect the solvent inlet and outlet lines.
4. Unscrew the solvent valve (25) from the adapter (21).
5. Remove the seat (23) and o-rings (22, 24).
6. See manual 312782 to repair the valve.
7. Reassemble in the reverse order.

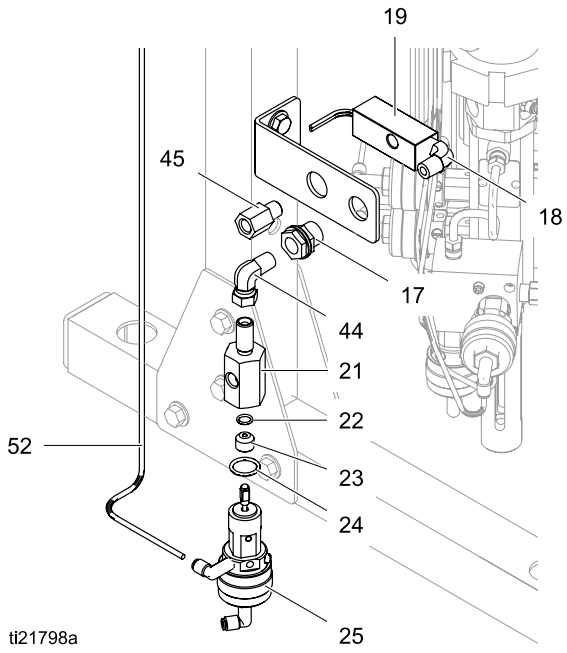
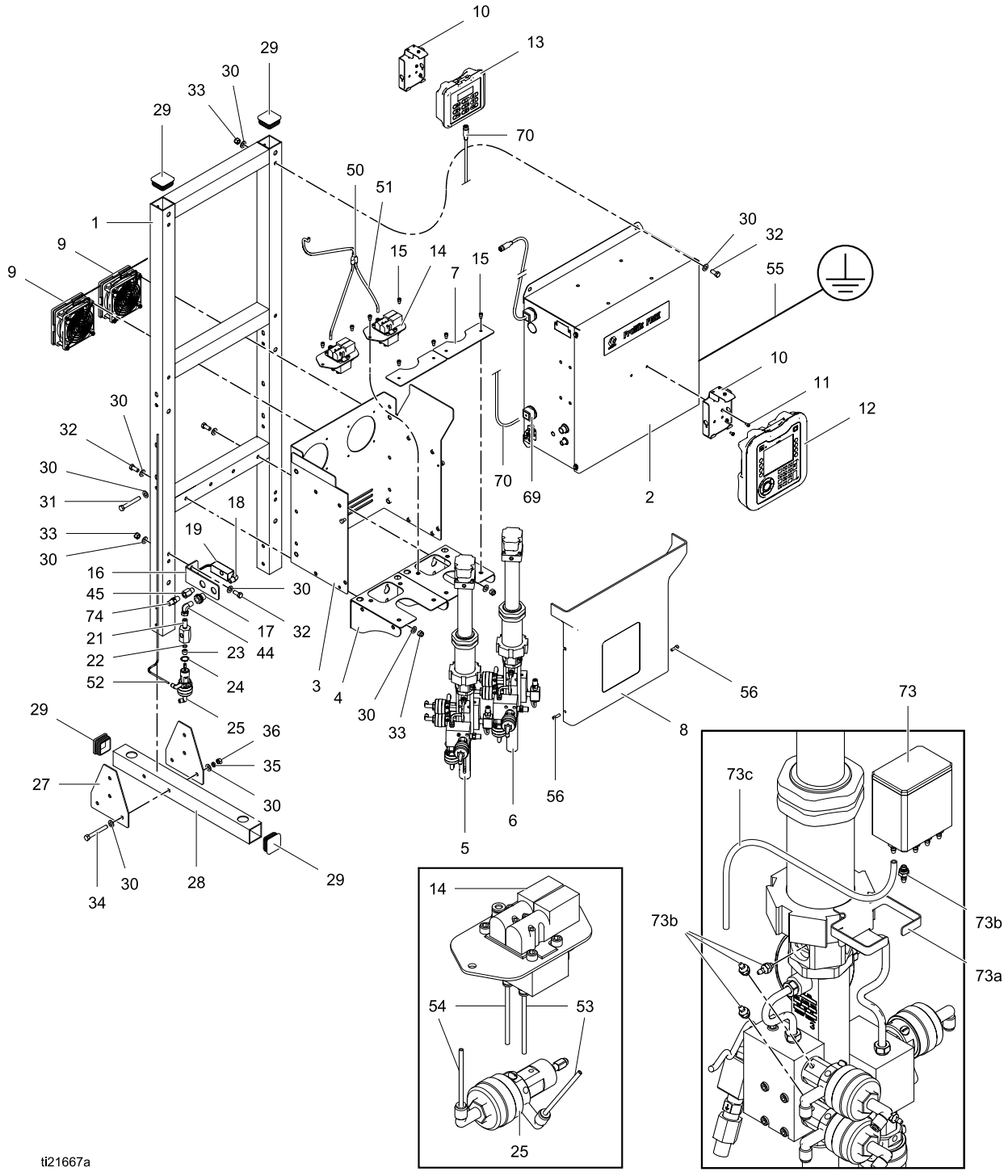


Figure 39 Solvent Valve and Solvent Flow Switch

Parts

Proportioner Parts

Part No. MC1000 Low Pressure Proportioner
Part No. MC2000 High Pressure Proportioner



Part No. MC1000 Low Pressure Proportioner

Part No. MC2000 High Pressure Proportioner

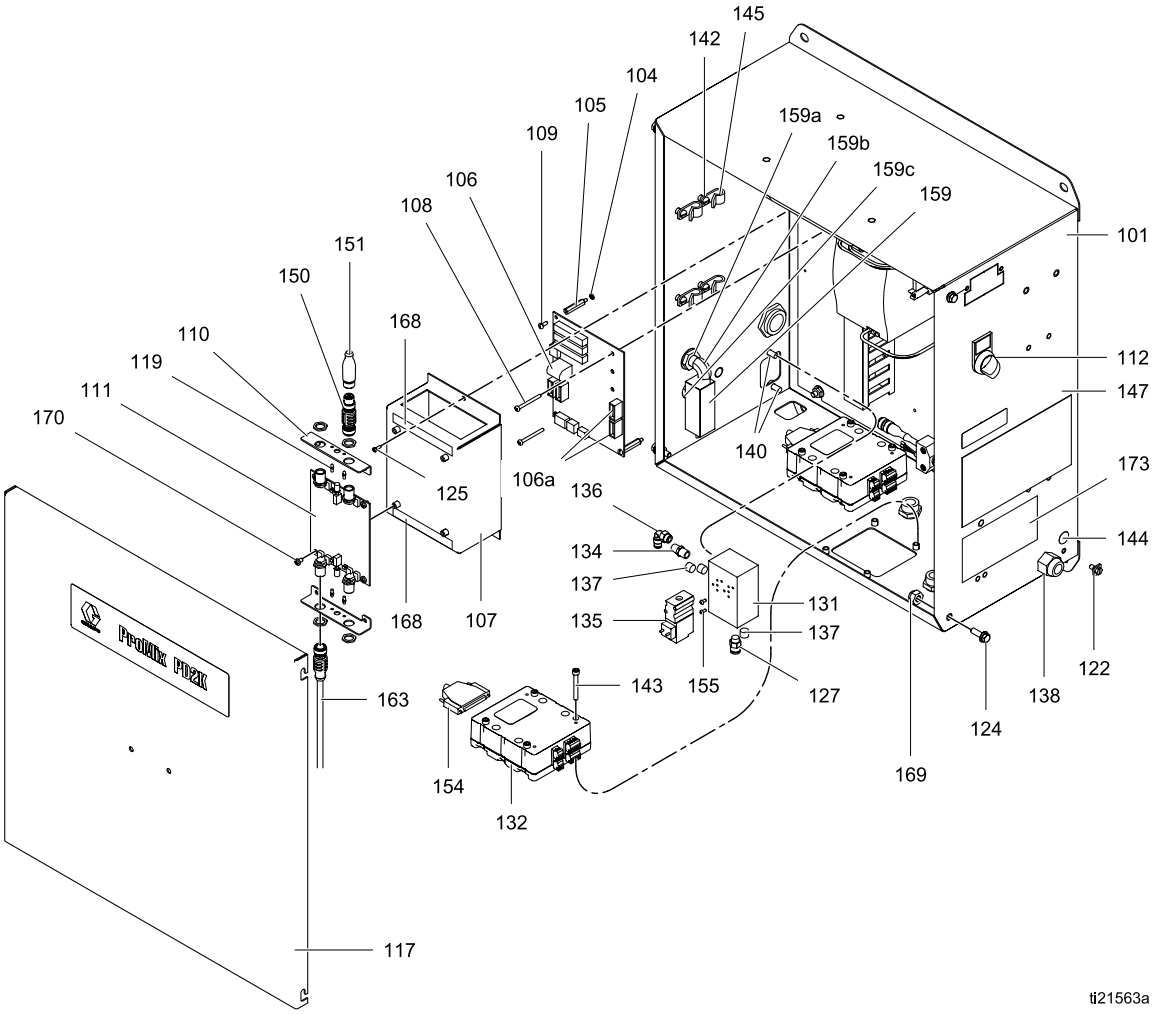
Ref	Part	Description	Qty
1	— — —	FRAME	1
2	— — —	CONTROL BOX, electrical; see Control Box Parts, page 55	1
3	— — —	PANEL, fluid	1
4	— — —	BRACKET, mounting	2
5	24T790	PUMP, 70 cc, A side, low pressure; for Model MC1000; see manual 332339	1
	24T791	PUMP, 70 cc, A side, high pressure; for Model MC2000; see manual 332339	1
6	24T788	PUMP, 35 cc, B side, low pressure; for Model MC1000; see manual 332339	1
	24T789	PUMP, 35 cc, B side, high pressure; for Model MC2000; see manual 332339	1
7	— — —	BRACKET, mounting, pump	2
8	24T771	COVER; includes (2) of item 56	1
9	24T770	KIT, fan	2
10	277853	BRACKET, mounting	2
11	— — —	SCREW, machine, pan head; M5 x 0.8; 10 mm	2
12	24U602	MODULE, display, advanced; includes item 12a	1
12a	16X039	TOKEN; latest version of software for the Advanced Display Module; not shown	1
13	24M731	MODULE, booth control	1
14	24T772	MANIFOLD, solenoid; see Solenoid Manifold Parts, page 58	2
15	C19798	SCREW, cap, socket head; 1/4–20 x 3/8 in. (10 mm)	8
16	16U655	BRACKET, mounting, valve	1
17	104641	FITTING, bulkhead	1
18	111763	ELBOW; 1/4 npt (mbe)	1
19	24T787	SWITCH, solvent flow; 1/4 npt(f) ports	1
21	15T717	ADAPTER, solvent valve	1
22	111457	O-RING; ptfe	1
23	15T725	RETAINER, seat, solvent valve	1
24	15Y627	O-RING; ptfe	1
25	15X303	VALVE, solvent; see manual 312782	1
27	— — —	GUSSET	4
28	— — —	LEG, floor stand	2
29	— — —	PLUG, tube, square	6

Ref	Part	Description	Qty
30	— — —	WASHER; 3/8	40
31	— — —	SCREW, cap, hex head; 3/8–16 x 2.75 in. (70 mm)	4
32	— — —	SCREW, cap, hex head; 3/8–16 x 7/8 in. (22 mm)	10
33	— — —	NUT, lock; 3/8–16	10
34	— — —	SCREW, cap, hex head; 3/8–16 x 3 in. (76 mm)	8
35	— — —	WASHER, lock; 3/8	8
36	— — —	NUT, hex; 3/8–16	8
43	— — —	WIRE HARNESS; for Model MC1000 (not shown)	2
	— — —	WIRE HARNESS; for Model MC2000 (not shown)	2
44	155541	SWIVEL, 90°; 1/4 npt(m) x 1/4 npsm(f)	1
45	15F741	FITTING, adapter; 1/4 npt(m) x 1/4 npt(f)	1
50	115287	FITTING, Y-tube; for 1/4 in. (6 mm) OD tubing	1
51	— — —	TUBE, polyethylene; 1/4 in. (6 mm) OD x 3 ft	A/R
52	— — —	TUBE, nylon; 5/32 in. (4 mm) OD x 3.5 ft	A/R
53	— — —	TUBE, nylon, green; for control air to turn valves on; 5/32 in. (4 mm) OD x 20 ft (cut to length required)	A/R
54	— — —	TUBE, nylon, red; for control air to turn valves off; 5/32 in. (4 mm) OD x 20 ft (cut to length required)	A/R
55	223547	GROUND WIRE	1
56	— — —	SCREW, cap, socket head; 1/4–20 x 3/4 in. (19 mm)	2
69	— — —	GROMMET, cable	1
70	16V429	CABLE, CAN, intrinsically safe, 5 pin; for booth control; fbe; 50 ft (15 m)	1
73	24T302	KIT, cup, TSL; includes items 73a-73e	2
73a	— — —	BRACKET	1
73b	24U617	KIT, barbed fittings; includes o-rings; package of 12	1
73c	— — —	TUBE, polyurethane; 1/4 in. (6 mm) OD; 10 ft (3.05 m); cut to fit	1
73d	— — —	PLUG, screw; 10–32; to replace unused item 73b at TSL cup; not shown	4
73e	— — —	GASKET; for item 73d; not shown	4
74	166421	NIPPLE, pipe; 1/4 npt	1

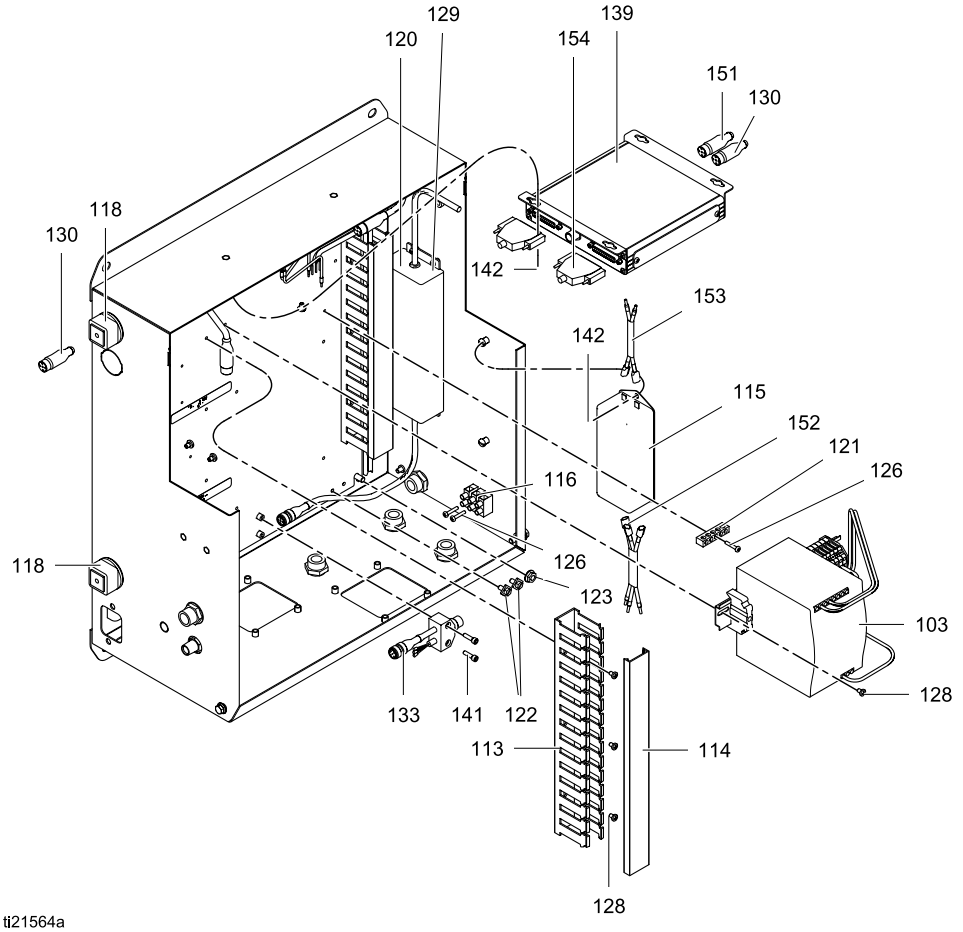
Items marked — — — are not available separately.

Control Box Parts

Electrical Control Box



Electrical Control Box (continued)



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Ref	Part	Description	Qty
101	— — —	ENCLOSURE	1
102	— — —	PANEL, back	1
103	24T769	POWER SUPPLY; 48 Vdc; 10 A; 480 W	1
104	— — —	WASHER, lock; no. 6	3
105	— — —	SPACER, standoff	3
106	255786	BOARD, barrier; includes item 106a	1
106a	15D979	FUSE; 400 mA, quick acting	2
107	— — —	COVER, barrier	1
108	— — —	SCREW, machine, pan head; 6–32 x 1.5 in. (38 mm)	2
109	— — —	SCREW, machine, pan head; 6–32 x 0.375 in. (10 mm)	3
110	— — —	BRACKET, board	2
111	24M485	BOARD, isolation, IS	1
112	16U725	SWITCH, selector, 2 position	1
113	— — —	DUCT, wire	1
114	— — —	COVER, duct	2
115	16V446	FILTER , line; 10A	1
116	— — —	BLOCK, terminal	1
117	— — —	COVER, enclosure	1
118	— — —	GROMMET	2
119	— — —	LIGHT	4
120	16T660	POWER SUPPLY; 24 Vdc, 4 A, 96 W	1

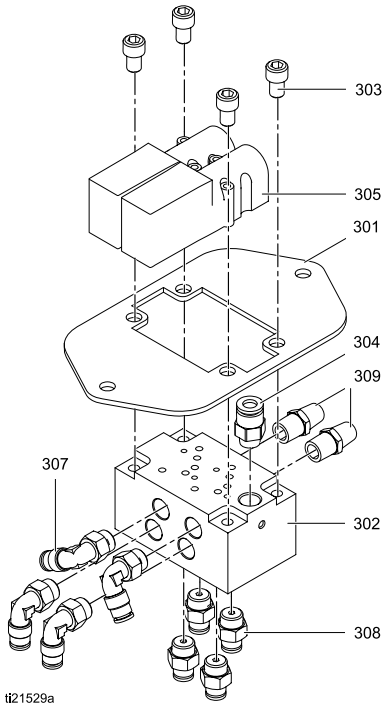
Ref	Part	Description	Qty
121	— — —	CONNECTOR, bar, ground	1
122	— — —	SCREW, ground; M5 x 0.8	3
123	— — —	NUT, hex, flange head; 1/4–20	4
124	— — —	SCREW, flanged, hex head; 1/4–20 x 0.75 in. (19 mm)	4
125	— — —	SCREW, machine, pan head; 10–24 x 0.375 in. (10 mm)	2
126	— — —	SCREW, machine, pan head; 10–32 x 0.75 in. (19 mm)	3
127	— — —	FITTING, connector; 1/8 npt(m) x 1/4 in. (6 mm) OD tube	1
128	— — —	SCREW, machine, pan head; 8–32 x 0.25 in. (6 mm)	8
129	— — —	SCREW, machine, binding head; 6–32 x 0.25 in. (6 mm)	4
130	121003	CABLE, CAN; fbe; 3.0 m	1
131	— — —	MANIFOLD, air	1
132	24N527	MODULE, control, pump	2
133	16P243	CABLE, splitter	1
134	— — —	MUFFLER	1
135	121324	VALVE, solenoid; 3–way	1
136	— — —	ELBOW, swivel; 1/8 npt(m) x 5/32 in. (4 mm) OD tube	1
137	— — —	PLUG, pipe; 1/8 npt(m)	3
138	— — —	STRAIN RELIEF, cord	4
139	24T773	MODULE, control, enhanced fluid	1
140	— — —	SCREW, machine, pan head; 1/4–20 x 0.5 in. (13 mm)	2
141	— — —	SCREW, cap, socket head; 8–32 x 0.625 in. (16 mm)	2
142	— — —	SCREW, machine, pan head; 10–32 x 0.25 in. (6 mm)	10
143	— — —	SCREW, machine, pan head; 10–32 x 1.5 in. (38 mm)	8
144▲	172953	LABEL, ground symbol	1
145	— — —	CLAMP; for 3/8 in. (10 mm) OD cable	4
147▲	15W598	LABEL, warning	1
148	— — —	HARNESS, CAN isolation, power (not shown)	1
150	16T072	ADAPTER, CAN cable, IS to non-IS	1
151	121227	CABLE, CAN; fbe; 0.6 m	1
152	— — —	HARNESS, 3–wire	1
153	— — —	HARNESS, 2–wire	1
154	16T659	CABLE, D-SUB, 25 pin, 2.5 ft	2
155	— — —	SCREW, self sealing	2
159	15T632	KIT, air flow switch; includes items 159a-159c	1
159a	104641	FITTING, bulkhead	1
159b	111763	ELBOW; 1/4 npt (mbe)	1
159c	113029	NIPPLE; 1/4 npt	1
163	16V429	CABLE, CAN, I.S.; fbe; 50 ft. 15.25 m)	1
168▲	16U600	LABEL, isolation board	1
169	— — —	NUT, hex, self-locking; 1/4–20	4
170	— — —	SCREW, machine, pan head; 8–32 x 0.312 in. (8 mm)	4
173▲	15W776	LABEL, warning	1

Items marked — — — are not available separately.

▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

Solenoid Manifold Parts

Part No. 24T772 Solenoid Manifold



Ref	Part	Description	Qty
301	— — —	PLATE	1
302	— — —	MANIFOLD	1
303	— — —	SCREW, cap, socket head; 1/4–20 x 0.375 in. (10 mm)	4
304	115671	CONNECTOR; 1/8 npt(m) x 1/4 in. (6 mm) OD tube	1
305	16P812	VALVE, solenoid	2
307	114151	FITTING, elbow, swivel; 1/8 npt(m) x 5/32 in. (4 mm) OD tube	4
308	114263	FITTING, straight; 1/8 npt(m) x 5/32 in. (4 mm) OD tube	4
309	C06061	MUFFLER	2

Items marked — — — are not available separately.

Technical Data

Positive Displacement Proportioner	U.S.	Metric
Maximum fluid working pressure:		
MC1000 Air Spray Systems	300 psi	2.1 MPa, 21 bar
MC2000 Air-Assisted Spray Systems	1500 psi	10.5 MPa, 105 bar
Maximum working air pressure:	100 psi	0.7 MPa, 7.0 bar
Air supply:	85–100 psi	0.6–0.7 MPa, 6.0–7.0 bar)
Air filter inlet size:	3/8 npt(f)	
Air filtration for air logic (user-supplied):	5 micron (minimum) filtration required; clean and dry air	
Air filtration for atomizing air (user-supplied):	30 micron (minimum) filtration required; clean and dry air	
Mixing ratio range:	0.1:1 — 50:1, ±1%	
Fluids handled:	one or two component: • solvent and waterborne paints • polyurethanes • epoxies • acid catalyzed varnishes • moisture sensitive isocyanates	
Viscosity range of fluid:	20–5000 centipoise	
Fluid filtration (user-supplied):	100 mesh minimum	
Maximum fluid flow:	800 cc/minute (depending on material viscosity)	
Fluid outlet size:	1/4 npt(m)	
External power supply requirements:	90 - 250 Vac, 50/60 Hz, 7 amps maximum draw 15 amp maximum circuit breaker required 8 to 14 AWG power supply wire gauge	
Operating temperature range:	36 to 122°F	2 to 50°C
Storage temperature range:	—4 to 158°F	—20 to 70°C
Weight (approximate):	195 lb	88 kg
Sound data:	Less than 75 dB(A)	
Wetted parts:	17–4PH, 303, 304 SST, Tungsten carbide (with nickel binder), perfluoroelastomer; PTFE, PPS, UHMWPE	

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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To place an order, contact your Graco Distributor or call to identify the nearest distributor.

Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

All written and visual data contained in this document reflects the latest product information available at the time of publication.

Graco reserves the right to make changes at any time without notice.

For patent information, see www.graco.com/patents.

Original Instructions. This manual contains English. MM 3A2800

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